

**CWA COMPLIANCE EVALUATION INSPECTION REPORT
U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 5**

Purpose: Compliance Evaluation Inspection

Facility: Bischer Farms
6121 Purdy Road
Ruth, Michigan 48470

NPDES Permit Number: MI0057669

Date of Inspection: 08/28/08

EPA Representatives: Cheryl Burdett, Life Scientist, (312) 886-1436
Jessica Millar, Environmental Scientist, (312) 886-2281
Valdis Aistars, Environmental Engineer, (312) 886-0264

State Representatives: none

Facility Representative: Brad Geiger, co-owner/operator

Exemption 6 and Exemption 7C

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Report Date: September 27, 2008

BACKGROUND

EPA and the Michigan Department of Environmental Quality (MDEQ) are working concurrently to determine compliance with permitted combined animal feeding operations (CAFOs) that are near waters of the U.S. On November 29, 2007, EPA drove by Bischer Farms to determine whether the facility warranted an inspection. During the drive-by EPA observed a visible discharge from the silage area to the roadside ditch adjacent to the production area. EPA sampled the water in the ditch. Sampling results can be found in Attachment C of this report.

EPA conducted a CAFO inspection of Bischer Farms at 9:15 am on August 28, 2008 to determine compliance with NPDES permit no. MI0057669. EPA interviewed Mr. Brad Geiger, a co-owner of Bischer Farms, and Mr. Melvin Smith, an employee. EPA also toured the facility. Photographs taken during the inspection are contained in Attachment B of this report.

Bischer Farms is located at 6121 Purdy Road, Ruth, Michigan 48470. The State of Michigan Department of Environmental Quality designated this farm as a CAFO via permit no. MI0057669 as of January 4, 2007. The permit expires on October 11, 2011.

Bischer Farms is a cattle finishing facility that raises cattle from calves to slaughter weight. The facility includes a 44-acre production area and 2142.7 acres that are used for land application of manure.

The inventory of animals includes 270 head of 300-500 lb cattle in the Red Barn, 1300 head of 600-1100 lb cattle in the New Barn, 700 head of 350-600 lb cattle in the Little Barn, and 1900-2000 head of less than 350 lb and 900-1300 lb cattle in the Big Barn.

SITE INSPECTION

Rain fell intermittently during EPA's inspection of this facility. According to the National Weather Service data for Huron County, there had not been a precipitation event for at least 24 hours prior to the inspection.

Bischer Farms borders the north side of Purdy Road. An unnamed ditch divides the production area from the road. The ditch was dry at the time of inspection, but the facility's permit notes that receiving waters from the production area include unnamed tributaries (Smith Drain and Cook Drain) to Elm Creek located south and east of the production area, and to Rock Falls Creek to the west. According to the USGS topographical map from 1982, both creeks flow into Lake Huron.

The production area is divided into two sections, referred to here as the 'West Sector' and the 'East Sector'. Mr. Geiger said that liquid from both sectors is collected into one holding pond located in the East Sector. The facility's Comprehensive Nutrient Management Plan (CNMP) states that approximately 3.74 million gallons of liquid manure and 28,868.5 tons of solid manure were produced on-site in the last 12 months. The CNMP states that liquid from the holding pond is pumped for land application onto 2142.7 acres owned or rented by Bischer Farms.

West Sector:

The West Sector is composed of two calf barns, a pasture, a residence, an office building, and several equipment outbuildings. Mr. Geiger explained that feed is hauled to the calf barns from the eastern sector, and waste from the calf barns is scraped and hauled to the eastern sector. Seepage into the pasture from the north side of the northern calf barn was observed, but did not appear to reach the roadside ditch (photo 55). Gutters direct roof runoff from the calf barns to the ground on the south side of the northern barn and the north side of the southern barn. No evidence of discharge to the roadside ditch was observed.

East Sector:

The East Sector of Bischer Farms is located approximately 200 yards east of the West Sector along Purdy Road. A schematic of the East Sector can be found in Attachment A. A concrete pad underlies part of this sector (photos 1-18), including the silage bunker, a commodity barn, a concrete compost structure, and the Red Barn. The concrete pad receives storm water runoff from the commodity barn and the Red Barn; leachate from the silage and solid waste stored on the pad; and liquid waste overflow when the barns are scraped. Mr. Geiger said that the concrete pad is graded south towards four catch basins, numbered Catch Basin 1 through Catch Basin 4 according to Attachment A. A vegetated earthen berm and a concrete wall border the south edge of the concrete pad. Four driveways connecting the road to the concrete pad are numbered Driveway 1 through Driveway 4 according to Attachment A. These driveways are elevated to prevent runoff. No discharge or runoff pathways from the concrete pad to the roadside ditch were observed at the time of the inspection. Mr. Smith said that liquid collected in the four catch basins is automatically pumped to the holding pond.

Mr. Smith explained that emergency generators are manually activated if electricity fails so that the catch basins can be pumped to the holding pond.. Mr. Smith said that overflow from the catch basins is collected in one section of the roadside ditch between culverts at Driveway 2 and Driveway 3. Mr. Smith said that overflow collected in the ditch is prevented from flowing to Elm Creek via a Emergency valve that closes the eastern culvert at Driveway 3 (photos 51-52; noted in Attachment A). Mr. Smith said that the emergency valve must be closed by hand, and that there is no automatic emergency notification system for electricity failure or catch basin overflow.

The north end of the concrete pad is bordered by the Red Barn and the back wall of the silage bunker. Concrete channels behind the Red Barn and the silage bunker wall (photos 24-26) collect runoff from the north side of the Red Barn and from the north end of the silage bunker. Mr. Smith explained that these channels are graded towards two catch basins, numbered Catch Basin 5 and Catch Basin 6. Catch Basin 5 is located south of the southeast corner of the holding pond, and Catch Basin 6 is located east of the holding pond. Mr. Smith said that liquid from Catch Basins 5 and 6 is automatically pumped to the holding pond.

A separate paved area underlies the New Barn, the Little Barn, the Hospital Barn, and a second concrete composting structure east of the silage bunker. This area receives runoff from the barn roofs and any silage leachate or liquid waste that escapes from the barns. Mr. Smith explained

that this paved area is graded towards a catch basin (Catch Basin 7) located just east of these structures. Catch Basin 7 is connected to Catch Basin 1 via a concrete channel and a pipe. Liquid from Catch Basin 1 is automatically pumped to the holding pond (photos 48-50). No discharge or runoff pathway was observed from the concrete channel connecting Catch Basin 7 to Catch Basin 1.

A small outdoor area adjacent to the hospital barn is slatted, with a pit beneath the slats that receives waste, called the Hospital Pit. Mr. Smith said that this pit is pumped into the holding pond or the Big Barn pit.

Waste from the Big Barn is contained in a 900'x60'x12' pit beneath the slatted floor of the Big Barn. This pit is pumped and hauled for direct land application. Mr. Smith explained that solid waste in the Big Barn pit is liquefied via liquid pumped from the holding pond (photos 39-42). Gutters on the roof of the Big Barn direct roof runoff to the paved area on the south border of the Big Barn. Mr. Smith said that this paved area is graded towards Catch Basin 1. Mr. Smith said that the roof runoff collected in Catch Basin 1 is pumped to the holding pond (photos 44-46). A vegetated earthen berm separates this paved area from the roadside ditch.

Bischer Farms has one holding pond, located in the northwestern corner of the East Sector of the facility (photos 19-23). Approximately 1 foot of freeboard was visible on a depth gauge that lacked clearly marked increments. Vegetation on the side berms grew approximately three to four feet high. Signs of erosion on the western side of the holding pond indicate past overflow into the bordering field (photos 27-34).

Records:

Bischer Farms has a Comprehensive Nutrient Management Plan (CNMP) that has been approved by a certified CNMP surveyor.

1. Large CAFO waste structures

At the time of inspection, the facility's CNMP did not include any record documenting the design volume of holding pond. As a result, EPA could not determine whether the holding pond has 6 months of storage for CAFO waste; whether the holding pond has volume enough for a 25-year, 24-hour rainfall event volume (4.45 inches); or whether the holding pond has enough additional capacity to maintain 12 inches of freeboard. Approximately 12 inches of freeboard was observed at the time of the inspection.

Mr. Geiger told EPA that the design volume information and certification by a professional engineer did exist, and might be found with Jeff Krohn, an engineer with NTCC, Larry Shook, an engineer with SME Inc., or Bruce Walls with NRCS.

2. Physical design and construction requirements

The holding pond at Bisher Farms contains a depth gauge with a crossbar delineating the freeboard volume. At the time of inspection, the CNMP did not include records documenting the current structural design of the holding pond, which was redone in 2002.

3. Inspection Requirements

Bischer Farms keeps weekly inspection reports of the holding pond. These inspection reports include the depth of the liquid in the holding pond and the available operating volume as indicated by the depth gauge. The holding pond berm is not inspected in detail, since the berm is not mowed enough for close observation of its structural integrity. The collection system, lift stations, mechanical and electrical systems, transfer stations, control structures and pump stations are inspected monthly.

4. Operation and Maintenance Requirements

At the time of inspection, there were no records included in the CNMP indicating that MDEQ had been notified that waste in Bischer Farms' holding pond rose above the maximum operational volume level and entered the emergency level.

Because the volume of the holding pond was not included in the CNMP, EPA could not determine whether there was a minimum operational volume of 6 months at some point during the period between November 1 and December 31 of each year. Mr. Geiger offered an invoice from Mid Thumb Irrigation Inc. for pumping and injection of waste in November as evidence of this minimum operational value for 2007 (Attachment D).

Vegetation is not maintained at a height below 6 inches above the ground on holding pond berm. Signs of erosion on the west side of the holding pond indicate that the vegetation may be too sparse to prevent erosion. Because of the height of the vegetation, EPA could not determine whether there was any damage to the berm caused by erosion, slumping or animal burrowing. At the time of inspection, there were no records included in the CNMP that noted actions taken to correct any problems with the holding pond berm. Mr. Geiger said that the liner in the holding pond was recently replaced. The facility does not record when problems with the collection system, lift stations, mechanical and electric systems, transfer stations, control structures, and pump stations are discovered or corrected.

5. Best Management Practices Requirements

Bischer Farms does not divert clean storm water from the contaminated portions of the production area. Instead, storm water is directed to or runs off onto the ground in the West Sector, and onto the production area in the East Sector, where it is directed to the holding pond. No animals have access to waters of the state.

The facility disposes of chemicals via a dumpster that is picked up by Richfield Management. Dead animals are composted in concrete waste storage structures that are separate from the liquid holding pond. EPA did not find records of mortality management in the facility's CNMP.

Bischer Farms conducts visual inspections of runoff management equipment. These include daily inspection of water lines, including drinking water and cooling water lines, and aboveground piping and transfer lines. The facility did not maintain records of these inspections or documentation of any actions taken to correct deficiencies discovered before January 2004. After

January 2004, Bischer Farms began maintaining inspection records and documentation of actions taken to correct problems with runoff management equipment. Only monthly inspections were conducted before June 2008. After June 2008, Bischer Farms began conducting weekly inspections.

The facility has not conducted a yearly sampling of waste or the soil at land application sites since 2004, when 11 fields were sampled. Four fields were sampled in 2003. Bischer Farms inspects land application equipment as it is used, but does not maintain records of these inspections. There were no records in the CNMP of annual calibration for land application equipment.

The facility both spreads and injects manure. Bischer Farms grows rye as ground cover for winter subsurface injection. Bischer Farms maintains a 150-foot unvegetated setback and 25-foot vegetated setback from waterways bordering land application fields. Land Application Logs are kept. Entries in the Land Application Log include field ID, field size, description of outlet flow before and after application, date, manure source, number of loads, amount spread per acre, soil conditions, and weather conditions (Attachment E). Expected and actual crop yields for each field are not included in the Land Application Log. Documentation and calculations of the total amount of nitrogen and phosphorous applied were not included in the Land Application Log. Printouts of the weather forecast at the time of application were not included in the Land Application Log.

6. Waste Sampling and Analysis Requirements.

Bischer Farms does not regularly sample the waste that is land applied. At the time of inspection, records in the CNMP indicate that since 2005, Bischer Farms has conducted sampling of its waste on February 14, 2005; September 18, 2006; January 29, 2007; and October 5, 2007 (Attachment F).

Summary of findings:

1. The holding pond berms appeared to be unmowed. On the west side of the holding pond, eroded runoff pathways indicated that the vegetation was not sufficiently dense enough to prevent erosion.

I.A.4.d.: Vegetation shall be maintained at a height not more than 6 inches above the ground on large CAFO waste dikes and the vegetation shall have sufficient density to prevent erosion.

2. An emergency pump with a manual valve is placed in the roadside ditch for emergency containment of process wastewater. The manual valve cannot be automatically shut in case of an overflow emergency.

I.A.4.c.: *The permittee shall only store large CAFO waste in a structure constructed in accordance with Part I.A.4.a.*

I.A.4.a.: *In the event that a rainfall event causes the level of large CAFO waste in the storage structure to rise above the maximum operational volume level and enter the emergency volume level, the Department shall be notified. The level in the storage structure shall be reduced within one week, unless a longer time period is authorized by the Department (the removed large CAFO waste shall be land applied in accordance with this permit or the Department shall be notified if another method of disposal is to be used) and the emergency volume shall be restored.*

3. Bischer Farms does not keep records of waste storage structure inspections or of issues that are addressed as a result of those inspections.

I.A.3.: *The permittee shall inspect the large CAFO waste storage structures a minimum of weekly year-round. A record of the inspections shall be maintained by the permittee and kept with the CNMP for a period of five years. These inspections shall include all of the following:*

- a) The large CAFO waste dikes for cracking, inadequate vegetative cover, woody vegetative growth, evidence of overflow, leaks, seeps, erosion, slumping, animal burrowing or breakthrough, and condition of the storage structure liner.*
- b) The depth of the large CAFO waste in the storage structure and the available operating volume as indicated by the depth gauge.*
- c) The collection system, lift stations, mechanical and electrical systems, transfer stations control structures and pump stations to assure that valves, gates and alarms are set correctly and all are properly functioning.*

4. The Land Application Log does not include print-outs of weather data or a reference to the location where electronic files are stored.

I.A.7.g.: *The results of land application inspections, monitoring, testing and record keeping shall be recorded in a "Land Application Log" which shall be kept up-to-date and with the CNMP. Log records shall be kept for a minimum of five years. The permittee shall document in the log in writing, as a minimum, records required by Part I.A.4.b.7) and all of the following information and inspection results:*

... F) Printouts of weather forecasts at the time of application. Weather forecasts may also be saved as electronic files in which case the files do not need to be physically located in the log, but the log shall reference the location where the files are stored.

5. Bischer Farms does not record inspections of land application equipment. The CNMP does not include records of annual calibrations of land application equipment.

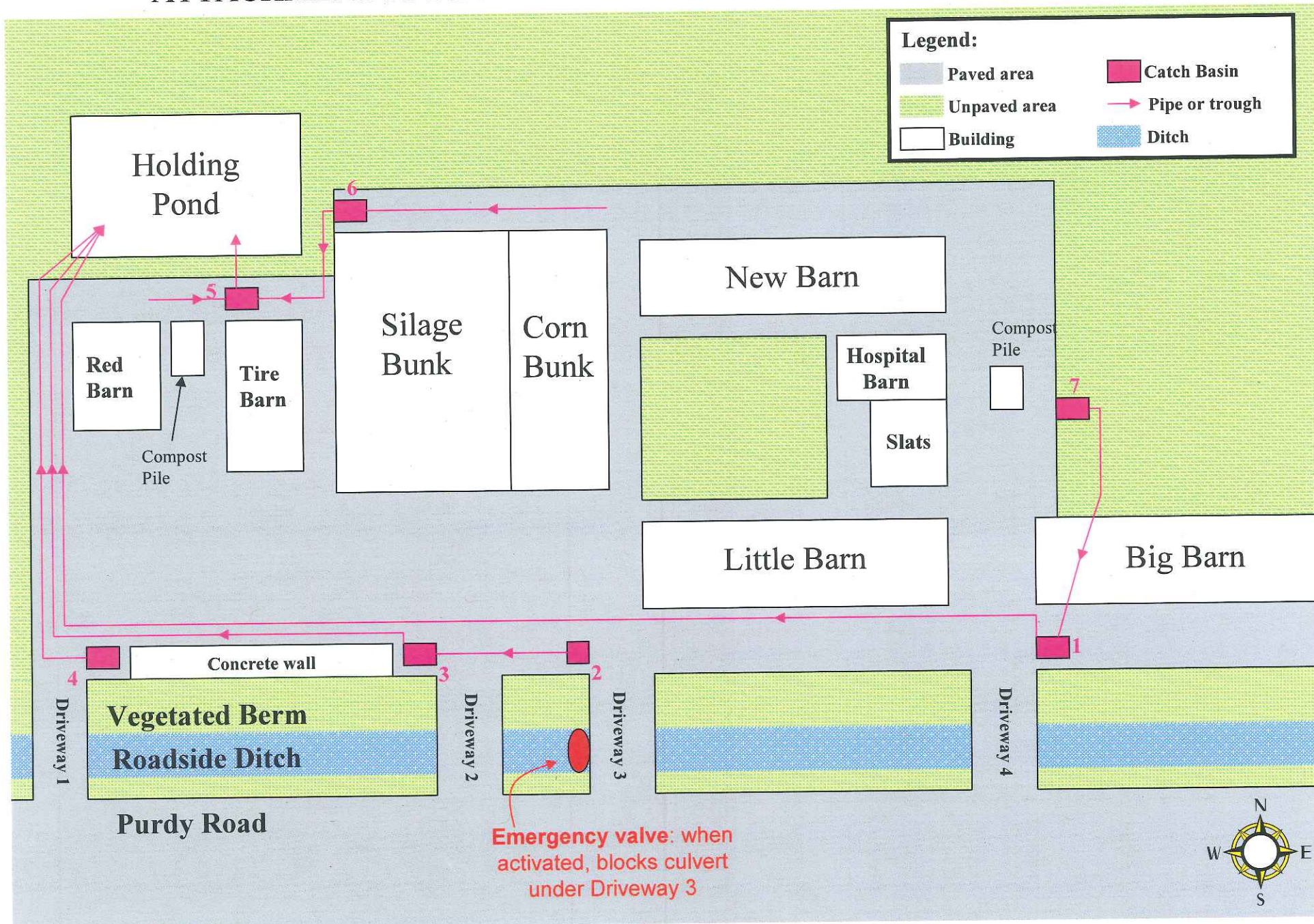
I.A.7.b.F): *The permittee shall inspect all land application equipment daily during use for leaks, structural integrity, and proper operation and maintenance. Land application equipment shall be*

calibrated annually to ensure proper application rates. Maintain written records of inspections and calibrations.

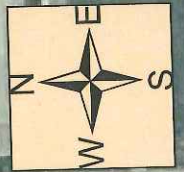
Attachments:

- A. Map of East Sector waste management system provided by Mr. Smith.
- B. Inspection photographs.
- C. November 29, 2007 EPA sampling results.
- D. November 2007 invoice for liquid manure pumping and injection from Mid Thumb Irrigation Inc.
- E. Bischer Farms Land Application Logs, November 2007 – January 2008.
- F. Bischer Farms waste sampling results since 2005.

ATTACHMENT A. Schematic of East Sector of Bischer Farms (not to scale)



BISCHER FARMS



250 125 0 250 Meters

Bischer Beef Huron County, MI

- Legend**
- Watershed Divide
 - Impaired Waters Lines
 - Assessed Waters Lines
 - Unassessed Streams
 - Perennial
 - Ditch/Canal
 - Intermittent



Lake Huron
(Imparied)

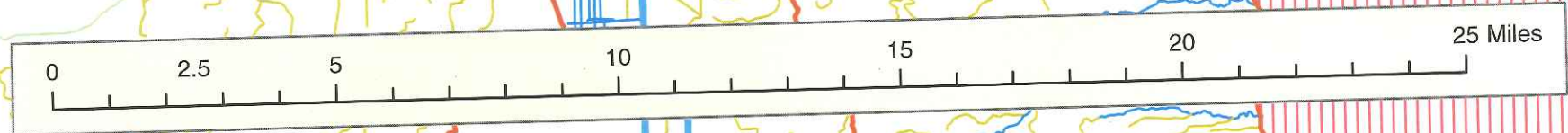
Bischer Beef

Rock Falls Creek

Elm Creek

White River

White Rock Creek



Bischer Beef Huron County, MI

Legend

- Watershed Divide
- Impaired Waters Lines
- Assessed Waters Lines
- Unassessed Streams
- Perennial
- Ditch/Canal
- Intermittent



Cook Drain

Rock Falls Creek

Elm Creek



ATTACHMENT B. Inspection photographs. Photographs that are redundant or irrelevant are not included in this Attachment. Omitted photographs can be found in the case file.



Photo 1 (DSCN 3940)

Date/time: 08/28/08 9:33 am

Facing: West

Description: Paved pad underlying East Sector production area. Graded to the south (left).



Photo 2 (DSCN 3941)

Date/time: 08/28/08 9:34 am

Facing: South

Description: Driveway No. 2 connecting the East Sector paved pad to Purdy Road.

Driveway runs over the roadside ditch, and is elevated to prevent runoff from paved pad (foreground).

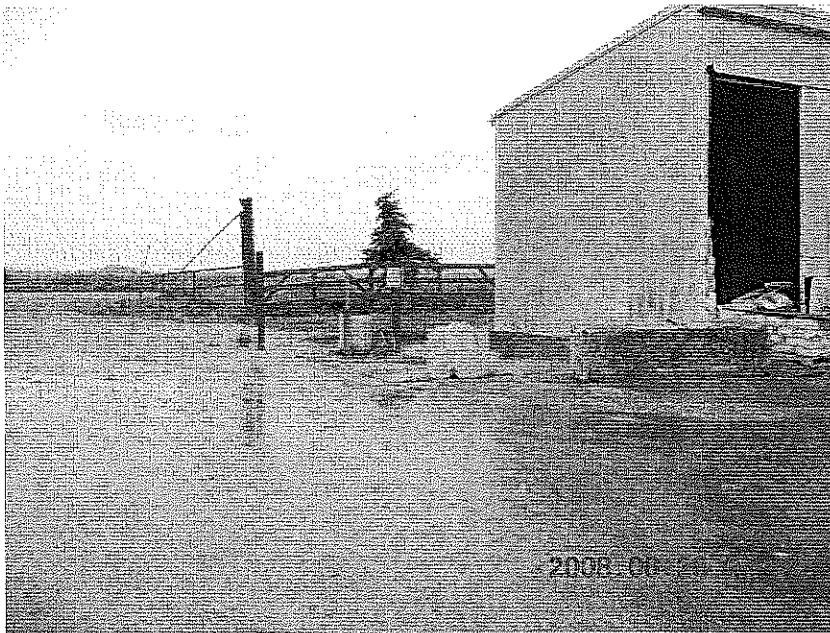


Photo 3 (DSCN 3942)

Date/time: 08/28/08 9:33 am

Facing: Southwest

Description: Catch Basin No. 2 at the south border of East Sector paved pad.

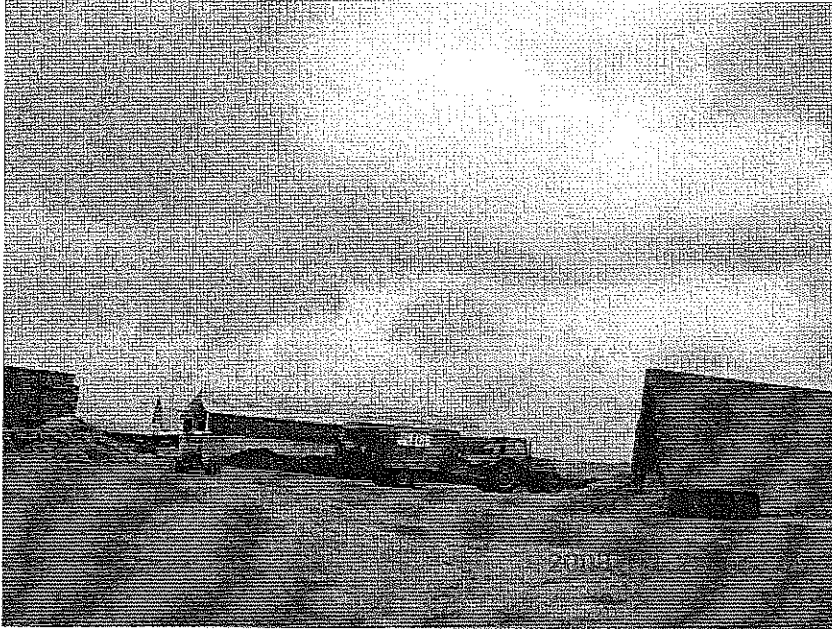


Photo 4 (DSCN 3944)

Date/time: 08/28/08 9:34 am

Facing: West

Description: Paved pad underlying production area in East Sector. Silage bunker, right.

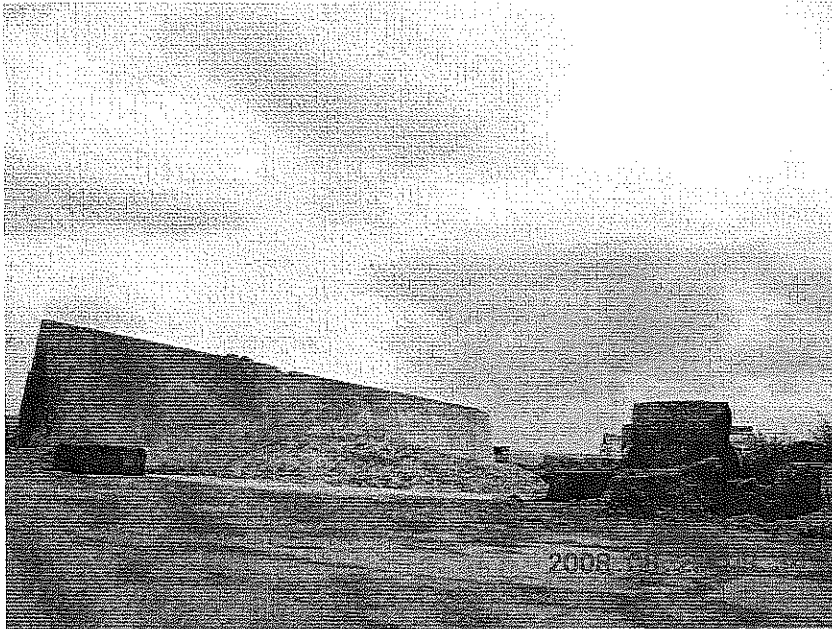


Photo 5 (DSCN 3945)

Date/time: 08/28/08 9:34 am

Facing: Northwest

Description: Eastern section of silage bunker on paved pad underlying East Sector.

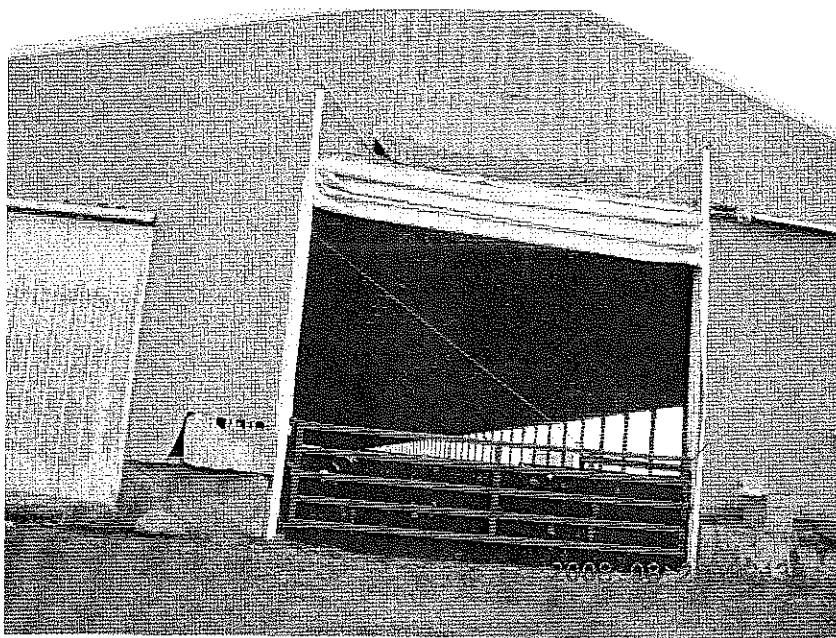


Photo 6 (DSCN 3946)

Date/time: 08/28/08 9:35 am

Facing: East

Description: West side of Little Barn (Little Barn location indicated on map, Attachment A).



Photo 7 (DSCN 3947)

Date/time: 08/28/08 9:37 am

Facing: North

Description: East end of silage bunker, left. New Barn, right, background (New Barn location indicated on map, Attachment A).



Photo 8 (DSCN 3949)

Date/time: 08/28/08 9:43 am

Facing: South

Description: Catch Basin No. 3 (to left of tractor) at the southwest corner of the paved pad underlying East Sector production area.



Photo 9 (DSCN 3950)

Date/time: 08/28/08 9:43 am

Facing: South

Description: Driveway No. 2 crossing roadside ditch from Purdy Road. Driveway No. 2 is elevated to prevent runoff from paved pad (foreground). Catch Basin No. 3, right.



Photo 10 (DSCN 3951)

Date/time: 08/28/08 9:43 am

Facing: West

Description: Close-up of silage located on paved pad in East Sector, foreground, and haybales, background. Silage and hay leachate runs into four catch basins located on south border of pad (to the left in the photograph).



Photo 11 (DSCN 3952)

Date/time: 08/28/08 9:43 am

Facing: North

Description: Silage located on paved pad in East Sector. Leachate runs into four catch basins along south border of pad.



Photo 12 (DSCN 3956)

Date/time: 08/28/08 9:44 am

Facing: West

Description: Haybale storage at the southwest corner of the East Sector paved area.



Photo 13 (DSCN 3957)

Date/time: 08/28/08 9:44 am

Facing: Northeast

Description: Manure solids on East Sector paved pad. This solid manure is collected from Red Barn, New Barn, Hospital Barn, and Little Barn (Barn locations indicated on map, Attachment A).

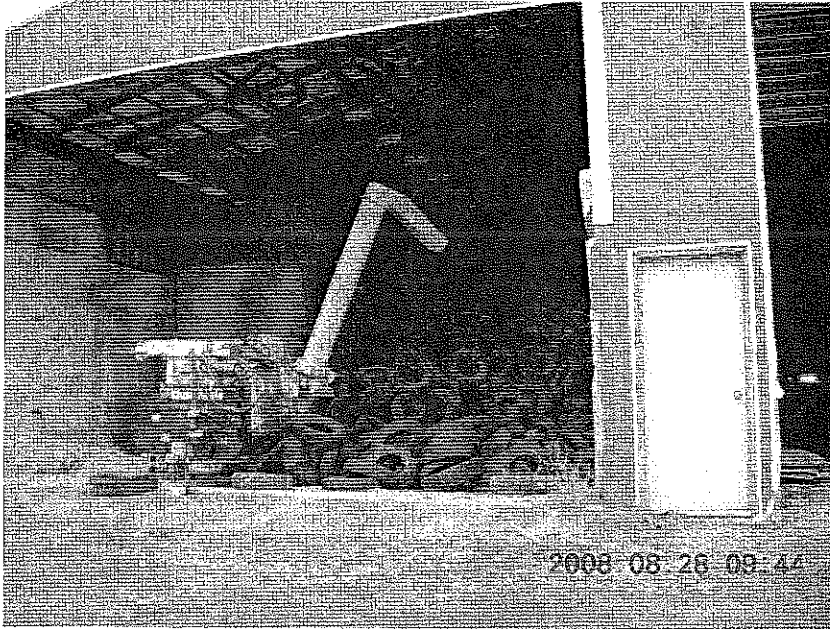


Photo 14 (DSCN 3958)

Date/time: 08/28/08 9:44 am

Facing: North

Description: Commodity Barn (aka Tire Barn) and liquid manure pump, left, located on the west side of the East Sector paved pad. Tracked silage and hay, foreground. Leachate from tracked silage and hay flows to four catch basins to the south of the East Sector paved pad.

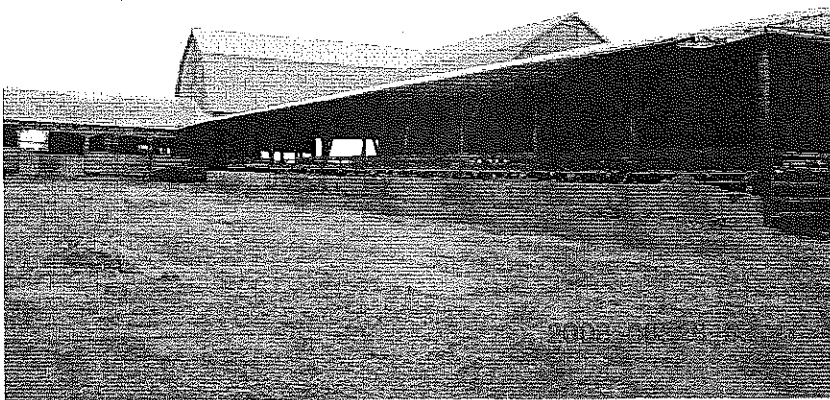


Photo 15 (DSCN 3959)

Date/time: 08/28/08 9:44 am

Facing: Northeast

Description: Red Barn, background, and tracked silage and hay, foreground. Leachate from tracked silage and hay flows to Catch Basins 1-4 at the south of the East Sector paved pad.

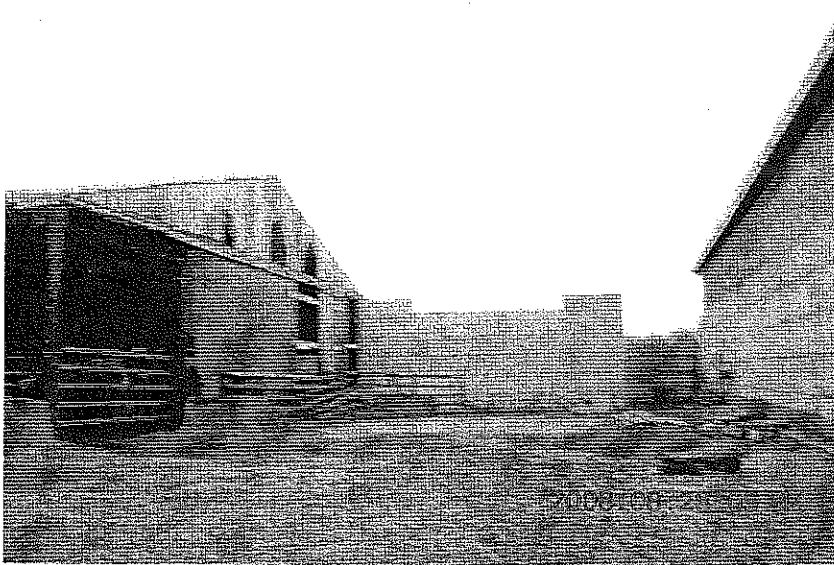


Photo 16 (DSCN 3960)

Date/time: 08/28/08 9:44 am

Facing: North

Description: Red Barn, left. Commodity Barn, right. Concrete compost storage, center. Leachate from compost storage flows into Catch Basin 5, located behind the compost storage structure. Tracked silage and hay, foreground. Leachate from tracked silage and hay flows to four catch basins to the south of the East Sector paved pad.



Photo 17 (DSCN 3964)

Date/time: 08/28/08 9:45 am

Facing: South

Description: Southwest corner of East Sector paved pad. Driveway No. 1, indicated by green arrow, connects the East Sector paved pad to Purdy Road. Driveway is elevated to prevent runoff into roadside ditch that runs between the paved pad and Purdy Road. Catch Basin No. 4 indicated by pink circle.

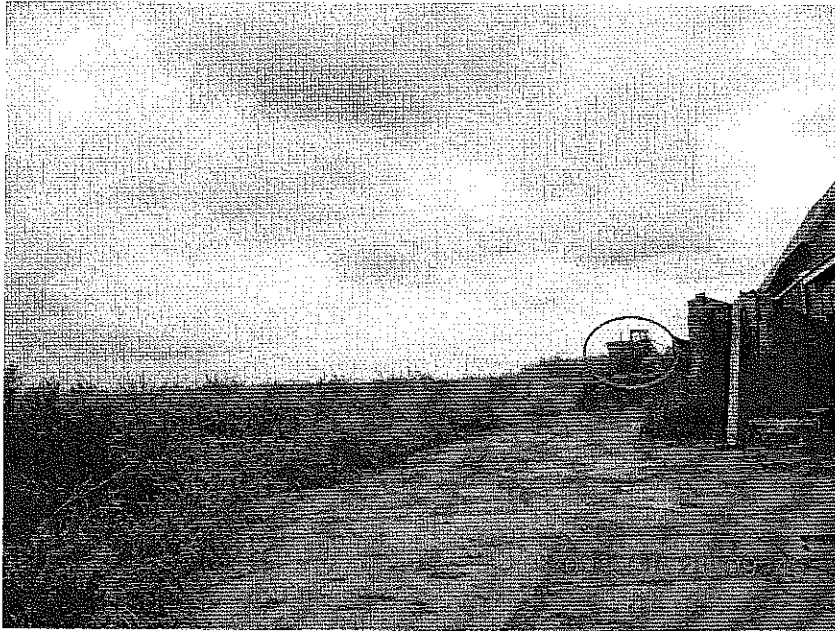


Photo 18 (DSCN 3969)

Date/time: 08/28/08 9:46 am

Facing: North

Description: West side of Red Barn, right. West edge of East Sector pad, left. Tractor parked at southwest corner of the manure holding pond, background, indicated by pink circle.



Photo 19 (DSCN 3972)

Date/time: 08/28/08 9:48 am

Facing: North

Description: Standing water located near the southwest corner of the manure holding pond.



Photo 20 (DSCN 3975)

Date/time: 08/28/08 9:49 am

Facing: North

Description: Manure holding pond, right. Hose, center, is pumping liquid from the manure holding pond to Slat Barn (Slate Barn location indicated on map, Attachment A) in order to liquefy solid wastes in Slat Barn pit.

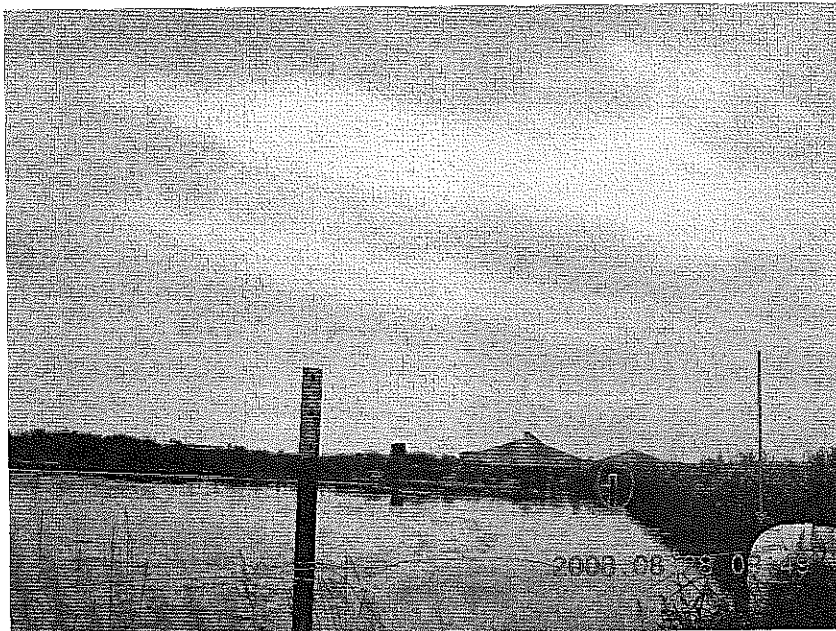


Photo 21 (DSCN 3977)

Date/time: 08/28/08 9:49 am

Facing: East

Description: Pipe from Catch Basins 1-4 and 7, foreground, indicated by pink arrow. Pipe from Catch Basins 5 and 6, background, indicated by pink circle. Umowed vegetation along berm, background.



Photo 22 (DSCN 3979)

Date/time: 08/28/08 9:50 am

Facing: Southeast

Description: Pipe from Catch Basins No.s 1-4 and Catch Basin 7, foreground. Pipe from Catch Basins 5 and 6, background, indicated by pink circle.



Photo 23 (DSCN 3981)

Date/time: 08/28/08 9:51 am

Facing: North

Description: Unmowed vegetation along northeast side of holding pond berm, background.

Depth gauge, center, indicated by pink circle.



Photo 24 (DSCN 3986)

Date/time: 08/28/08 9:53 am

Facing: South

Description: Unmowed vegetation along south side of holding pond berm, foreground. Trough behind Red Barn and composting structure, background. Trough is graded towards Catch Basin 5, indicated by pink circle, which is pumped to manure holding pond.



Photo 25 (DSCN 3987)

Date/time: 08/28/08 9:53 am

Facing: Northwest

Description: Input pipe from Catch Basin 5 and 6 to manure holding pond amid unmowed vegetation along southeast corner of holding pond berm.

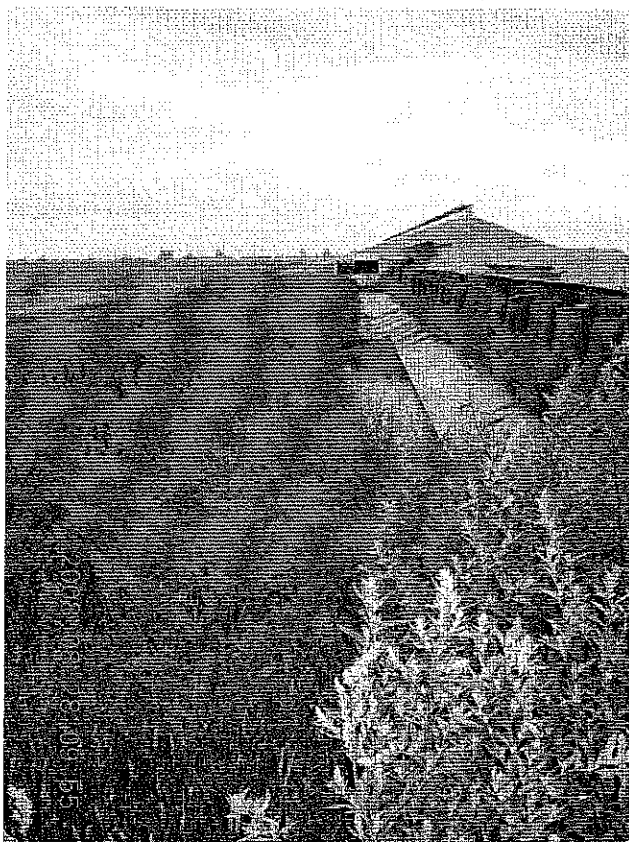


Photo 26 (DSCN 3992)

Date/time: 08/28/08 9:55 am

Facing: East

Description: Trough at the north border of the East Sector paved area catches overflow from silage bunker, right. Trough is graded towards Catch Basin 6, which is pumped to holding pond.



Photo 27 (DSCN 3998)

Date/time: 08/28/08 9:57 am

Facing: East

Description: Signs of erosion on west side of west holding pond berm.



Photo 28 (DSCN 3999)

Date/time: 08/28/08 9:57 am

Facing: East

Description: Signs of erosion on west side of west holding pond berm.



Photo 29 (DSCN 4000)

Date/time: 08/28/08 9:57 am

Facing: East

Description: Signs of erosion on west side of west holding pond berm.

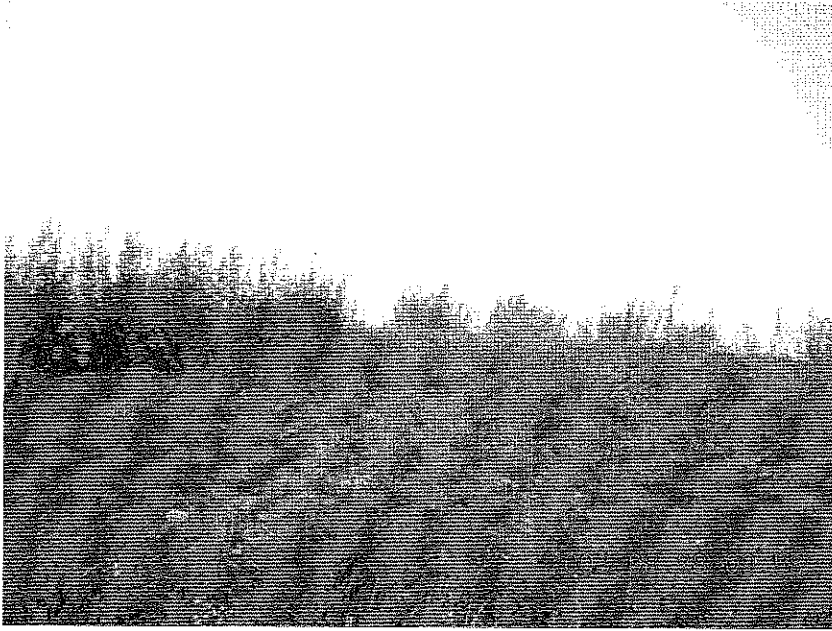


Photo 30 (DSCN 4001)

Date/time: 08/28/08 9:58 am

Facing: East

Description: Signs of erosion on west side of west holding pond berm.



Photo 31 (DSCN 4002)

Date/time: 08/28/08 9:58 am

Facing: East

Description: Signs of erosion on west side of west holding pond berm.

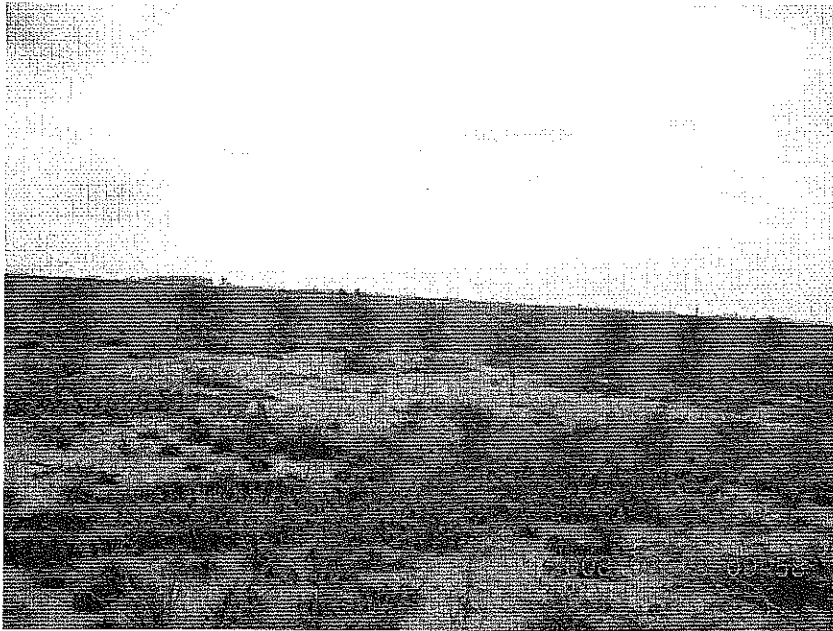


Photo 32 (DSCN 4003)

Date/time: 08/28/08 9:58 am

Facing: West

Description: Signs of erosion below the west berm of the holding pond.



Photo 33 (DSCN 4005)

Date/time: 08/28/08 9:58 am

Facing: South

Description: Signs of erosion and standing water below the west berm of the holding pond.



Photo 34 (DSCN 4006)

Date/time: 08/28/08 9:58 am

Facing: East

Description: Signs of erosion on and below the west berm of the holding pond.



Photo 35 (DSCN 4008)

Date/time: 08/28/08 10:01 am

Facing: East

Description: Catch Basin No. 4, indicated by pink arrow, at south end of East Sector paved pad.



Photo 36 (DSCN 4012)

Date/time: 08/28/08 10:05 am

Facing: West

Description: Catch Basin No. 2 at south end of East Sector paved pad, right, indicated by pink arrow. Elevated driveway berm at the west side of Driveway No. 3, left.



Photo 37 (DSCN 4013)

Date/time: 08/28/08 10:05 am

Facing: West

Description: Southwest corner of the Slat Barn. Storm water falls from gutters onto the East Sector paved pad, where it flows to Catch Basin No. 1.



Photo 38 (DSCN 4017)

Date/time: 08/28/08 10:08 am

Facing: Southeast

Description: Catch Basin No. 1 at south end of paved pad in East Sector. Hose (indicated by pink circle) is pumping liquid from the manure holding pond, through the catch basin, and into the Slat Barn pit for liquefying solid waste in the Slat Barn pit.



Photo 39 (DSCN 4019)

Date/time: 08/28/08 10:11 am

Facing: West

Description: Hose, center, is pumping liquid from the holding pond, through Catch Basin No. 1, and into the Slat Barn for liquefying solid waste in the Slat Barn pit.

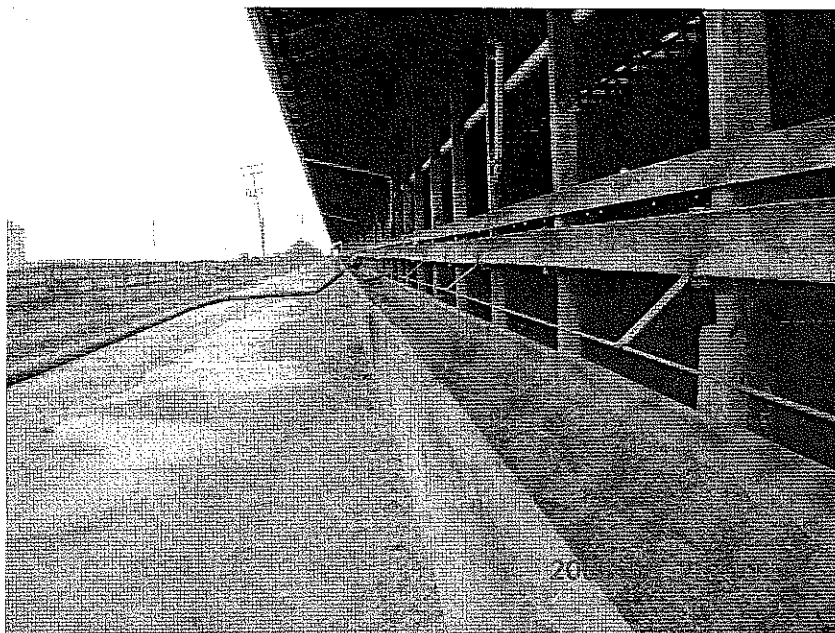


Photo 40 (DSCN 4021)

Date/time: 08/28/08 10:13 am

Facing: West

Description: Hose, left, is pumping liquid backwards from the holding pond, through Catch Basin No. 1, and into the Slat Barn for liquefying solid waste in the Slat Barn pit.

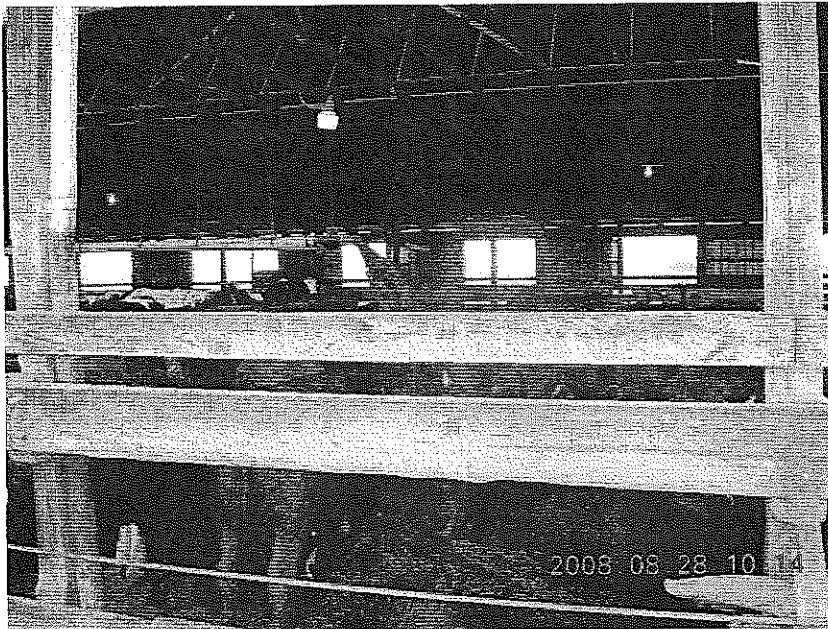


Photo 41 (DSCN 4023)

Date/time: 08/28/08 10:14 am

Facing: North

Description: Eastern end of Slat Barn. Pipe (top left, indicated by pink arrow) is pumping liquid from the holding pond and into the Slat Barn for liquefying solid waste in the Slat Barn pit.

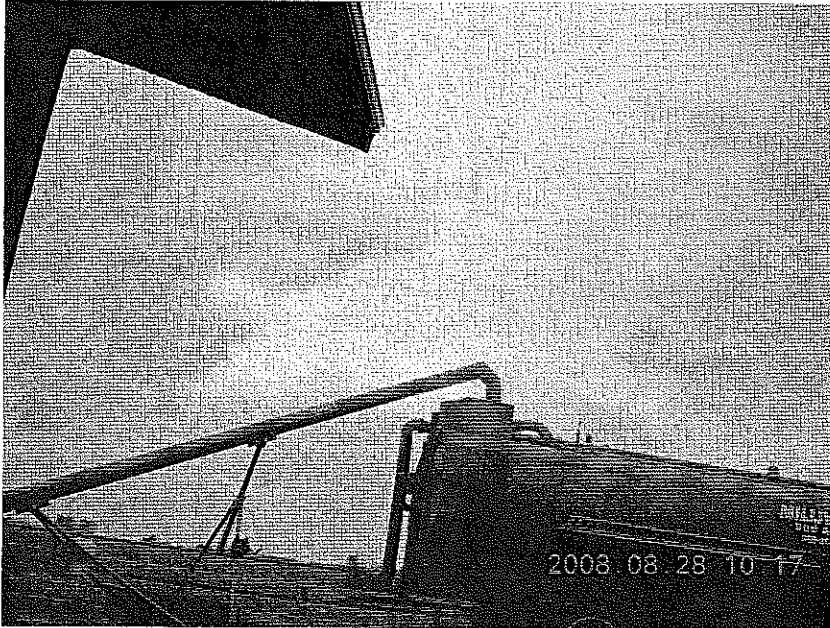


Photo 42 (DSCN 4026)

Date/time: 08/28/08 10:17 am

Facing: East

Description: Liquid manure hauler pumping manure from Slat Barn pit at eastern end of Slat Barn.



Photo 43 (DSCN 4028)

Date/time: 08/28/08 10:18 am

Facing: Southwest

Description: Unnamed roadside ditch viewed from east end of Slat Barn. Ditch runs between Purdy Road, background, and East Sector paved pad.

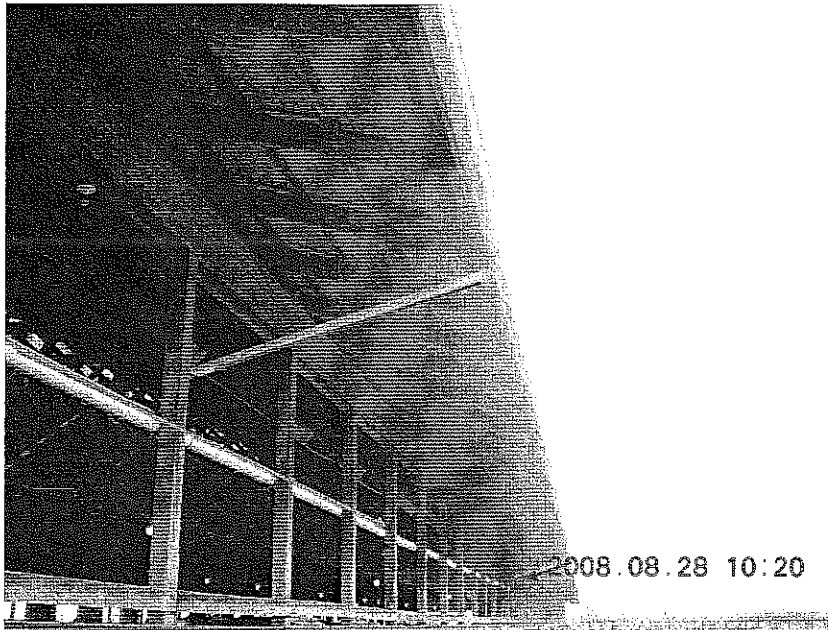


Photo 44 (DSCN 4029)

Date/time: 08/28/08 10:20 am

Facing: East

Description: South side of Slat Barn. Eave collection system connected to gutters (indicated by pink arrows) is not yet functional; instead, water falls onto pavement via holes cut in the gutter. The pipe that is visible below the gutters (indicated by green arrow) is not yet part of the system.

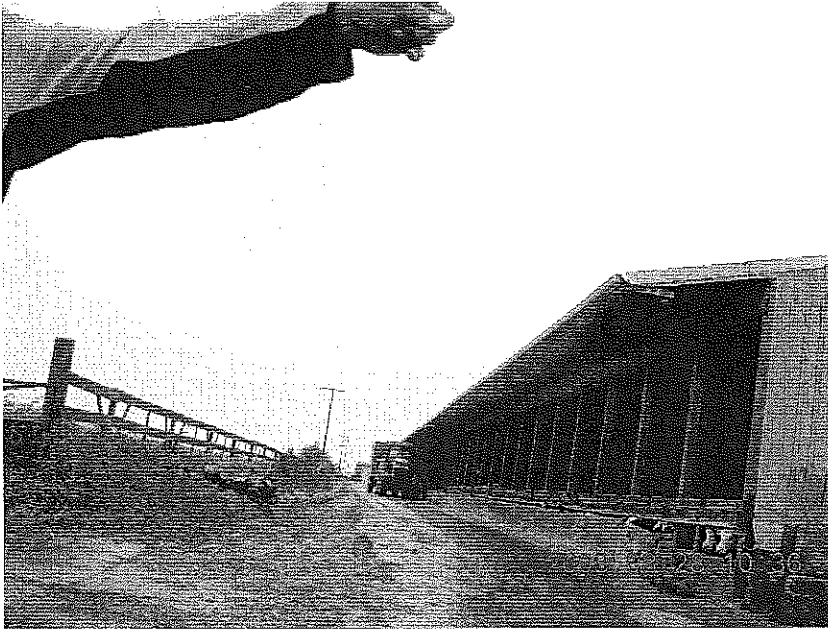


Photo 45 (DSCN 4031)

Date/time: 08/28/08 10:36 am

Facing: West

Description: Southeast corner of Slat Barn. Holes in the gutters direct storm water to the East Sector paved area, where storm water flows towards Catch Basin No. 1.

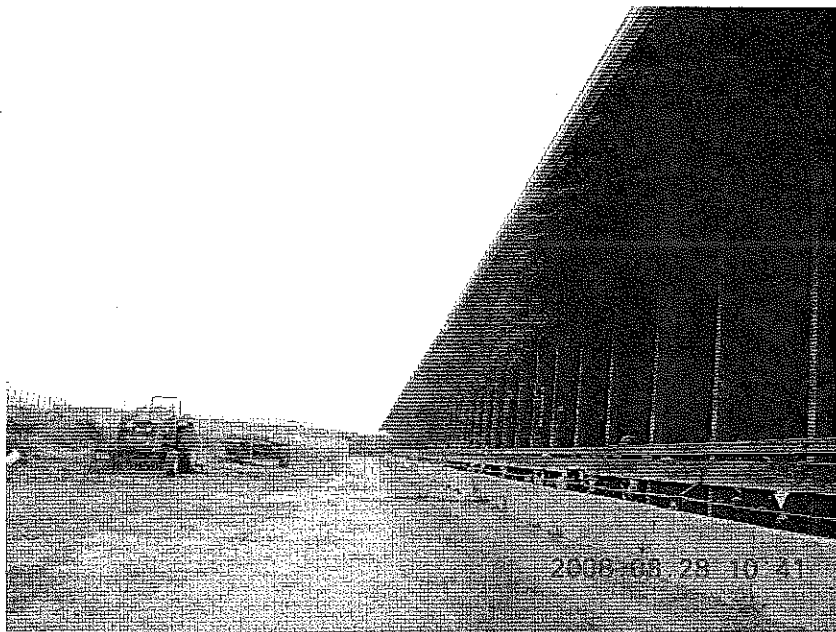


Photo 46 (DSCN 4039)

Date/time: 08/28/08 10:41 am

Facing: West

Description: South side of New Barn. Gutters direct storm water to ground, where storm water flows to Catch Basin 7.

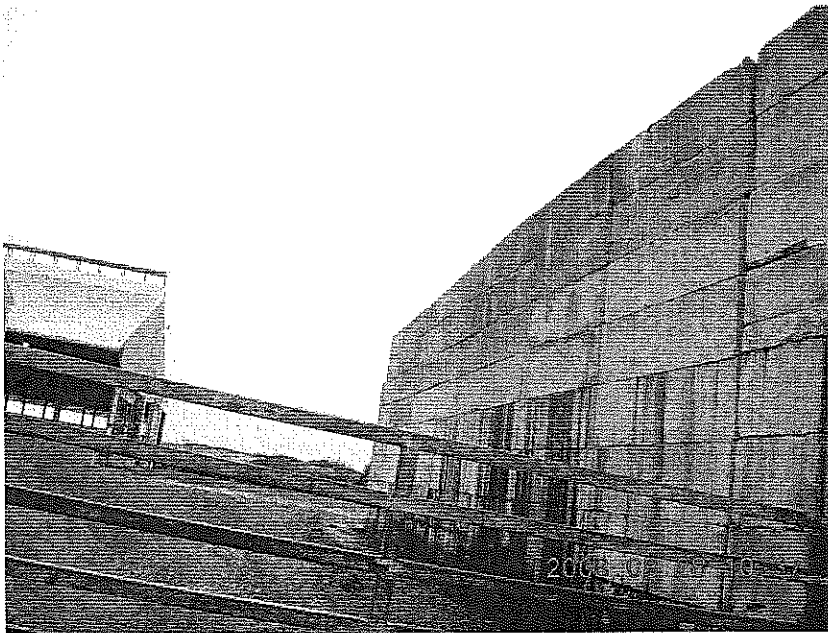


Photo 47 (DSCN 4036)

Date/time: 08/28/08 10:37 am

Facing: North

Description: New Barn, left background. Concrete compost storage structure, right foreground. Seepage from compost runs into Catch Basin 7.

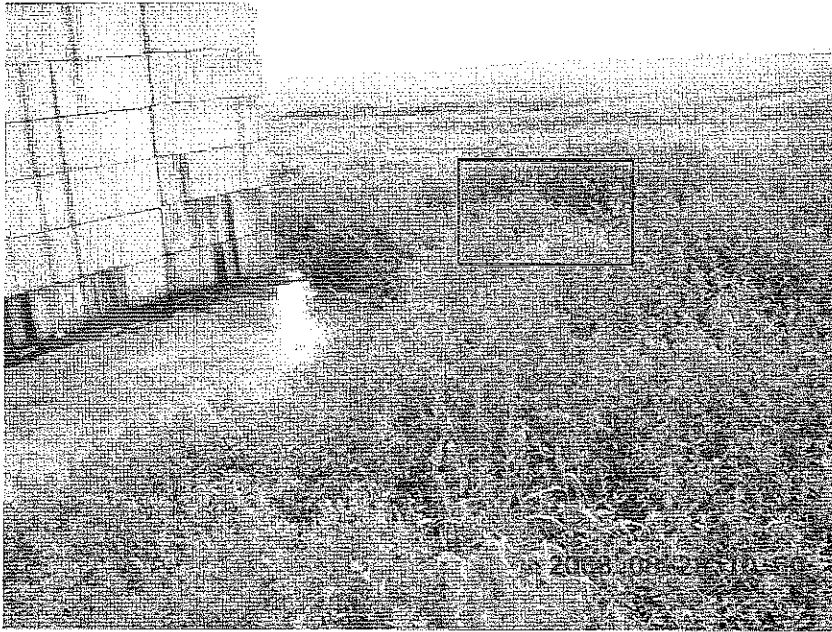


Photo 48 (DSCN 4046)

Date/time: 08/28/08 10:50 am

Facing: Northeast

Description: Concrete compost structure on east side of East Sector, right. Seepage from compost structure runs to Catch Basin 7 just north of paved pad, indicated by pink rectangle.

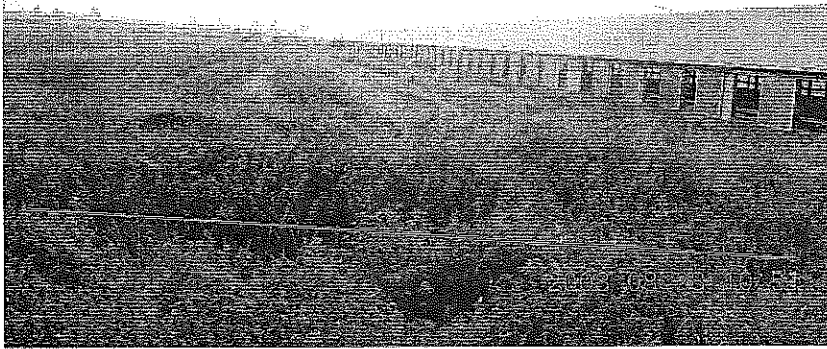


Photo 49 (DSCN 4048)

Date/time: 08/28/08 10:51 am

Facing: East

Description: Trough connecting Catch Basin 7 (left, out of photo), to Catch Basin No. 1. Trough is lined with concrete, and runs where vegetation dips in the photo (location and flow direction indicated by pink arrow). North side of Slat Barn, right background.



Photo 50 (DSCN 4050)

Date/time: 08/28/08 10:53 am

Facing: East

Description: Runoff from paved pad underlying east side of East Sector, located just south of concrete compost structure in photo 40, above. Liquid runs into trough connecting Catch Basin 7 to Catch Basin No. 1, from which it is pumped to the holding pond.

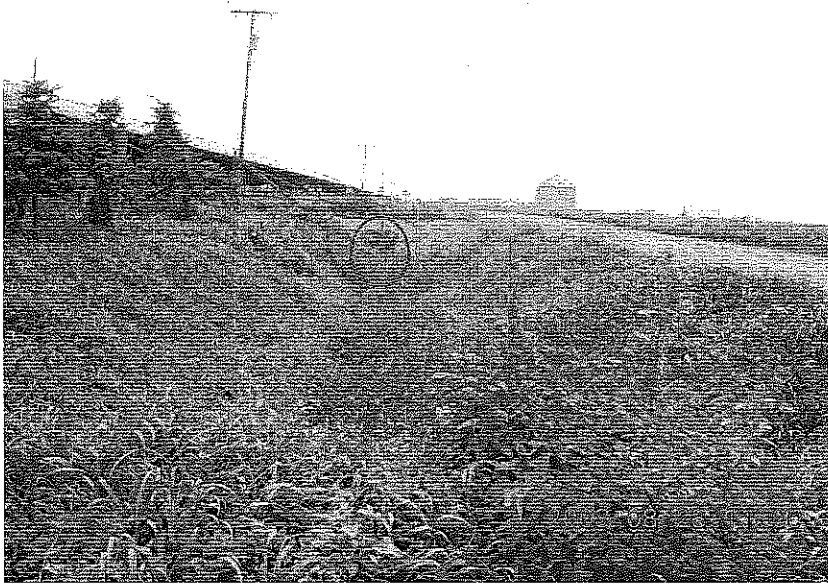


Photo 51 (DSCN 4051)

Date/time: 08/28/08 11:00 am

Facing: East

Description: Roadside ditch viewed from Driveway No. 2. Purdy Road, right. Black pipe in center background (indicated by pink circle) is the emergency valve, which can be manually closed to prevent flow through culvert underneath Driveway No. 3, background.

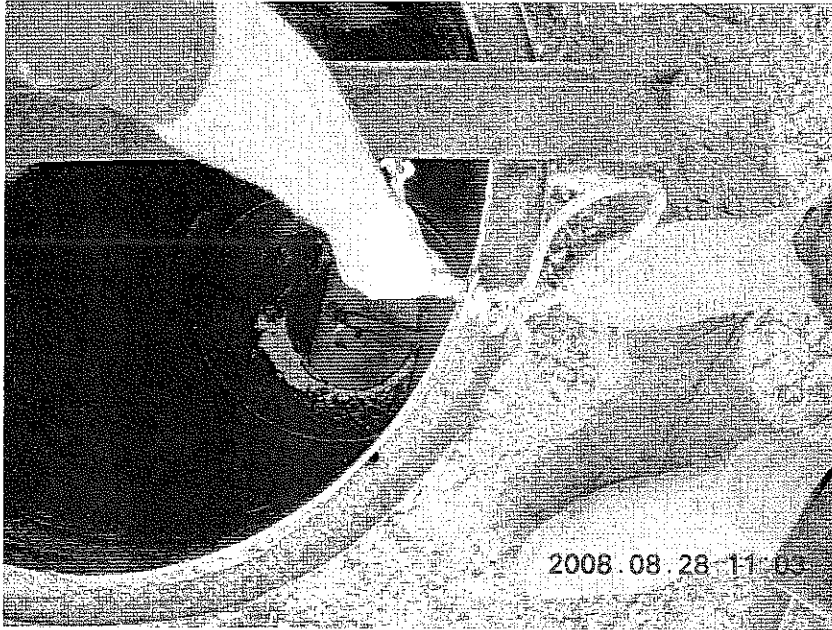


Photo 52 (DSCN 4052)

Date/time: 08/28/08 11:03 am

Facing: Downwards

Description: Emergency valve close-up. Yellow lid manually lowered to cover culvert underneath Driveway No. 3, preventing liquid flow to Cook Drain.

Commented [e1]: What keeps liquid from flowing to the western drain?



Photo 53 (DSCN 4053)

Date/time: 08/28/08 11:04 am

Facing: West

Description: Roadside ditch viewed from Driveway No. 3, just north of emergency valve. Mr. Geiger said that standing water is due to low ditch bottom.

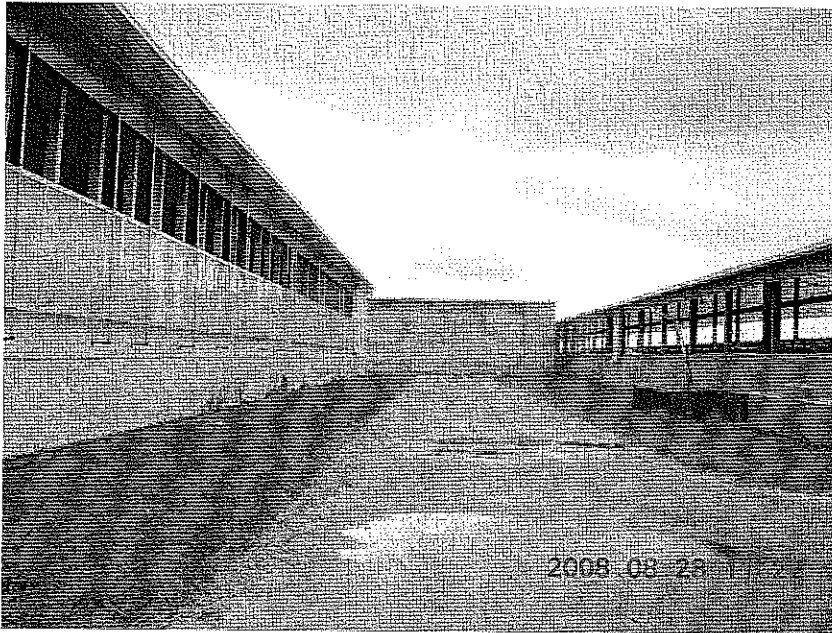


Photo 54 (DSCN 4058)

Date/time: 08/28/08 11:22 am

Facing: East

Description: Area between north calf barn (left) and south calf barn (right) in West Sector. Gutters on south side of north barn and north side of south barn direct storm water to the ground.

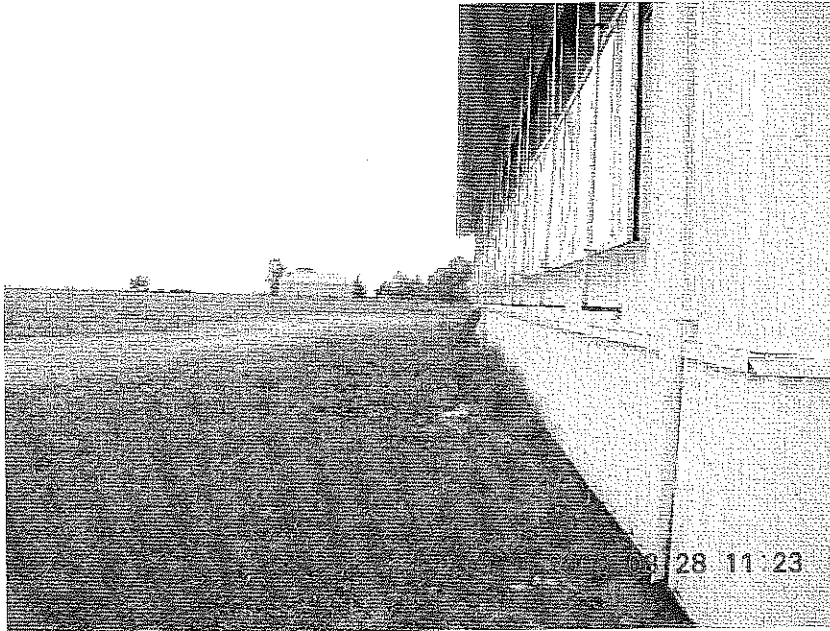


Photo 55 (DSCN 4059)

Date/time: 08/28/08 11:23 am

Facing: East

Description: Small pasture, background. Runoff from north side of north calf barn in West Sector, foreground.

[illegible]

Distribution: White — Accompanies Shipment; Pink — Coordinator Field Files; Yellow — Laboratory File

5-06241



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5 CHICAGO REGIONAL LABORATORY
536 SOUTH CLARK STREET
CHICAGO, ILLINOIS 60605

Date: 1/16/2008

Subject: Review of Region 5 Data for Michigan CAFO Inspection

From: Angela Tescher, Analyst *AT*
Region 5 Chicago Regional Laboratory

To: Water Division, US EPA Region 5
77 West Jackson Boulevard
Chicago, IL 60604

The data being transmitted under this cover memo successfully passed CRL's internal data review procedures as documented in our current Quality Management Plan (QMP) and appropriate Standard Operating Procedures (SOPs). Please be aware that CRL does not perform data validation which is based on your data quality objectives. This function must be performed independently of the laboratory generating the data

Attached are Results for: Michigan CAFO Inspection

Analyses included in this report:

Solids, TDS
Total Phosphorus

Solids, TSS

TKN

Sylvia Griffin

JAN 16 2008

Data Management Coordinator and Date Received

Date Transmitted: / JAN 16 / 2008

Please have the U.S. EPA Project Manager/Officer call the CRL Sample Coordinator at 3-7444 for any comments or questions.

Please sign and date this form below and return it with any comments to:

Sylvia Griffin
Data Management Coordinator
Region 5 Central Regional Laboratory
ML-10C

Received by and Date

Comments:



Environmental Protection Agency Region 5 Chicago Regional Laboratory

536 South Clark Street, Chicago, IL 60605
Phone:(312)353-8370 Fax:(312)886-2591

Water Division, US EPA Region 5
77 West Jackson Boulevard
Chicago IL, 60604

Project: Michigan CAFO Inspection
Project Number: 011CLB2007
Project Manager: Cheryl Burdett

Reported:
Jan-16-08 08:03

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
011CLB2007S01-Aquilla Clean Water Catch Basin Drain	0711016-01	Water	Nov-29-07 09:40	Nov-30-07 10:43
011CLB2007S02-Bischer S Rd Side Ditch	0711016-02	Water	Nov-29-07 12:15	Nov-30-07 10:43
011CLB2007S03-Bischer N Side of RD Ditch	0711016-03	Water	Nov-29-07 14:30	Nov-30-07 10:43
011CLB2007B01-Saginaw Bay District	0711016-04	Water	Nov-29-07 17:05	Nov-30-07 10:43

AT 01/16/08
Angela Tescher, Analyst

Report Name: 0711016 FINAL Jan 16 08 0803
Page 1 of 6



Environmental Protection Agency Region 5 Chicago Regional Laboratory

536 South Clark Street, Chicago, IL 60605
Phone:(312)353-8370 Fax:(312)886-2591

Water Division, US EPA Region 5
77 West Jackson Boulevard
Chicago IL, 60604

Project: Michigan CAFO Inspection
Project Number: 011CLB2007
Project Manager: Cheryl Burdett

Reported:
Jan-16-08 08:03

Phosphorus, Colorimetric, EPA 351.4 US EPA Region 5 Central Regional Laboratory

011CLB2007S01-Aquila Clean Water Catch Basin Drain (0711016-01) Water Sampled: Nov-29-07 09:40 Received: Nov-30-07 10:43

Analyte	Result	Flags / Qualifiers	MDL	Limit	Units	Dilution	Batch	Prepared	Analyzed
Total Phosphorus	0.11	J	0.06	0.30	mg/L	1	B712017	Dec-11-07	Dec-11-07

011CLB2007S02-Bischer S Rd Side Ditch (0711016-02) Water Sampled: Nov-29-07 12:15 Received: Nov-30-07 10:43

Analyte	Result	Flags / Qualifiers	MDL	Limit	Units	Dilution	Batch	Prepared	Analyzed
Total Phosphorus	0.41		0.06	0.30	mg/L	1	B712017	Dec-11-07	Dec-11-07

011CLB2007S03-Bischer N Side of RD Ditch (0711016-03) Water Sampled: Nov-29-07 14:30 Received: Nov-30-07 10:43

Analyte	Result	Flags / Qualifiers	MDL	Limit	Units	Dilution	Batch	Prepared	Analyzed
Total Phosphorus	3.56		0.06	0.30	mg/L	1	B712017	Dec-11-07	Dec-11-07

011CLB2007B01-Saginaw Bay District (0711016-04) Water Sampled: Nov-29-07 17:05 Received: Nov-30-07 10:43

Analyte	Result	Flags / Qualifiers	MDL	Limit	Units	Dilution	Batch	Prepared	Analyzed
Total Phosphorus	U		0.06	0.30	mg/L	1	B712017	Dec-11-07	Dec-11-07

AT. 01/16/08
Angela Tescher, Analyst

Report Name: 0711016 FINAL Jan 16 08 0803

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Environmental Protection Agency Region 5 Chicago Regional Laboratory

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Water Division, US EPA Region 5
77 West Jackson Boulevard
Chicago IL, 60604

Project: Michigan CAFO Inspection
Project Number: 011CLB2007
Project Manager: Cheryl Burdett

Reported:
Jan-16-08 08:03

Total Kjeldahl Nitrogen, EPA 351.4

US EPA Region 5 Central Regional Laboratory

011CLB2007S01-Aquilla Clean Water Catch Basin Drain (0711016-01) Water Sampled: Nov-29-07 09:40 Received: Nov-30-07 10:43

Analyte	Result	Flags / Qualifiers	MDL	Limit	Units	Dilution	Batch	Prepared	Analyzed
Total Kjeldahl Nitrogen	1.50		0.130	0.650	mg/L	1	B712026	Dec-19-07	Dec-19-07

011CLB2007S02-Bischer S Rd Side Ditch (0711016-02) Water Sampled: Nov-29-07 12:15 Received: Nov-30-07 10:43

Analyte	Result	Flags / Qualifiers	MDL	Limit	Units	Dilution	Batch	Prepared	Analyzed
Total Kjeldahl Nitrogen	3.90		0.130	0.650	mg/L	1	B712026	Dec-19-07	Dec-19-07

011CLB2007S03-Bischer N Side of RD Ditch (0711016-03) Water Sampled: Nov-29-07 14:30 Received: Nov-30-07 10:43

Analyte	Result	Flags / Qualifiers	MDL	Limit	Units	Dilution	Batch	Prepared	Analyzed
Total Kjeldahl Nitrogen	8.60		0.130	0.650	mg/L	1	B712026	Dec-19-07	Dec-19-07

011CLB2007B01-Saginaw Bay District (0711016-04) Water Sampled: Nov-29-07 17:05 Received: Nov-30-07 10:43

Analyte	Result	Flags / Qualifiers	MDL	Limit	Units	Dilution	Batch	Prepared	Analyzed
Total Kjeldahl Nitrogen	U		0.130	0.650	mg/L	1	B712026	Dec-19-07	Dec-19-07

At. 01/16/08
Angela Tescher, Analyst

Report Name: 0711016 FINAL Jan 16 08 0803

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Environmental Protection Agency Region 5 Chicago Regional Laboratory

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Chicago IL, 60604

Project: Michigan CAFO Inspection
Project Number: 011CLB2007
Project Manager: Cheryl Burdett

Reported:
Jan-16-08 08:03

Dissolved Solids, SM 2540C

US EPA Region 5 Central Regional Laboratory

011CLB2007S01-Aquila Clean Water Catch Basin Drain (0711016-01) Water Sampled: Nov-29-07 09:40 Received: Nov-30-07 10:43

Analyte	Result	Flags / Qualifiers	MDL	Limit	Units	Dilution	Batch	Prepared	Analyzed
Total Dissolved Solids	370		20.0	20.0	mg/L	1	B712005	Dec-04-07	Dec-04-07

011CLB2007S02-Bischer S Rd Side Ditch (0711016-02) Water Sampled: Nov-29-07 12:15 Received: Nov-30-07 10:43

Analyte	Result	Flags / Qualifiers	MDL	Limit	Units	Dilution	Batch	Prepared	Analyzed
Total Dissolved Solids	676		20.0	20.0	mg/L	1	B712005	Dec-04-07	Dec-04-07

011CLB2007S03-Bischer N Side of RD Ditch (0711016-03) Water Sampled: Nov-29-07 14:30 Received: Nov-30-07 10:43

Analyte	Result	Flags / Qualifiers	MDL	Limit	Units	Dilution	Batch	Prepared	Analyzed
Total Dissolved Solids	650		20.0	20.0	mg/L	1	B712005	Dec-04-07	Dec-04-07

011CLB2007B01-Saginaw Bay District (0711016-04) Water Sampled: Nov-29-07 17:05 Received: Nov-30-07 10:43

Analyte	Result	Flags / Qualifiers	MDL	Limit	Units	Dilution	Batch	Prepared	Analyzed
Total Dissolved Solids	U		20.0	20.0	mg/L	1	B712005	Dec-04-07	Dec-04-07

AA 01/16/08
Angela Tescher, Analyst

Report Name: 0711016 FINAL Jan 16 08 0803

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Environmental Protection Agency Region 5 Chicago Regional Laboratory

536 South Clark Street, Chicago, IL 60605
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Water Division, US EPA Region 5
77 West Jackson Boulevard
Chicago IL, 60604

Project: Michigan CAFO Inspection
Project Number: 011CLB2007
Project Manager: Cheryl Burdett

Reported:
Jan-16-08 08:03

Total Suspended Solids, SM 2540 D US EPA Region 5 Central Regional Laboratory

011CLB2007S01-Aquilla Clean Water Catch Basin Drain (0711016-01) Water Sampled: Nov-29-07 09:40 Received: Nov-30-07 10:43

Analyte	Result	Flags / Qualifiers	MDL	Limit	Units	Dilution	Batch	Prepared	Analyzed
Total Suspended Solids	163			5.0	mg/L	1	B712004	Dec-04-07	Dec-04-07

011CLB2007S02-Bischer S Rd Side Ditch (0711016-02) Water Sampled: Nov-29-07 12:15 Received: Nov-30-07 10:43

Analyte	Result	Flags / Qualifiers	MDL	Limit	Units	Dilution	Batch	Prepared	Analyzed
Total Suspended Solids	70.6			5.0	mg/L	1	B712004	Dec-04-07	Dec-04-07

011CLB2007S03-Bischer N Side of RD Ditch (0711016-03) Water Sampled: Nov-29-07 14:30 Received: Nov-30-07 10:43

Analyte	Result	Flags / Qualifiers	MDL	Limit	Units	Dilution	Batch	Prepared	Analyzed
Total Suspended Solids	576			5.0	mg/L	1	B712004	Dec-04-07	Dec-04-07

011CLB2007B01-Saginaw Bay District (0711016-04) Water Sampled: Nov-29-07 17:05 Received: Nov-30-07 10:43

Analyte	Result	Flags / Qualifiers	MDL	Limit	Units	Dilution	Batch	Prepared	Analyzed
Total Suspended Solids	U			5.0	mg/L	1	B712004	Dec-04-07	Dec-04-07

01/16/08
Angela Tescher, Analyst

Report Name: 0711016 FINAL Jan 16 08 0803

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Chicago IL, 60604

Project: Michigan CAFO Inspection
Project Number: 011CLB2007
Project Manager: Cheryl Burdett

Reported:
Jan-16-08 08:03

Notes and Definitions

- J The identification of the analyte is acceptable; the reported value is an estimate.
- U Not Detected
- NR Not Reported

At. 01/16/08
Angela Tescher, Analyst

Report Name: 0711016 FINAL Jan 16 08 0803

Page 6 of 6

Items for Project Manager Review

LabNumber	Analysis	Analyte	Exception
B712004-SRM1	Solids, TSS	Total Suspended Solids	Exceeds upper control limit
	Total Phosphorus	(Water)	J-Flags used
	TKN	(Water)	J-Flags used
	Total Phosphorus	(Water)	RPD calculations based on %Recovery
	TKN	(Water)	RPD calculations based on %Recovery
	Total Phosphorus	(Water)	Result calculations based on MDL
	TKN	(Water)	Result calculations based on MDL
	Solids, TDS	(Water)	Result calculations based on MDL
			VERSION 5.85:2834
			Default Report (not modified)

Sample, Log and Extraction Comments

0711016-01

Solids, TDS

pH(6)

pH(6)

Solids, TSS

pH(6)

pH(6)

TKN

pH(1)

pH(1)

Total Phosphorus

pH(1)

pH(1)

0711016-02

Solids, TDS

pH(6)

pH(6)

Solids, TSS

pH(6)

pH(6)

TKN

pH(1)

pH(1)

Total Phosphorus

pH(1)

pH(1)

0711016-03

Solids, TDS

pH(6)

pH(6)

Solids, TSS

pH(6)

pH(6)

TKN

pH(1)

pH(1)

Total Phosphorus

pH(1)

pH(1)

0711016-04

Solids, TDS

pH(5)

pH(5)

Solids, TSS

pH(5)

pH(5)

TKN

pH(1)

pH(1)

Total Phosphorus

pH(1)

pH(1)



Environmental Protection Agency Region 5 Chicago Regional Laboratory

536 South Clark Street, Chicago, IL 60605
Phone: (312) 353-8370 Fax: (312) 886-2591

WORK ORDER

Printed: 1/16/2008 8:04:47AM

0711016

US EPA Region 5 Central Regional Laboratory

Client: Water Division, US EPA Region 5
Project: Michigan CAFO Inspection

Project Manager: Marilyn Jupp
Project Number: 011CLB2007

Report To:

Cheryl Burdett
Water Division, US EPA Region 5

77 West Jackson Boulevard
Chicago, IL 60604

Phone: (312) 353-2004
Fax: (312) 886-2001

Date Due: Jan-16-08 15:00 (45 day TAT)

Received By: William Sargent

Date Received: Nov-30-07 10:43

Logged In By: William Sargent

Date Logged In: Nov-30-07 11:06

Samples Received at: 4.2°C
Labels: Yes
Seals Intact: Yes
Received on ice: Yes
Paperwork Included: Yes

Analysis	Due	TAT	Expires	Comments
----------	-----	-----	---------	----------

0711016-01 011CLB2007S01-Aquilla Clean Water Catch Basin Drai [Water] Sampled Nov-29-07 09:40 Central

Solids, TDS	Jan-16-08 12:00	45	Dec-06-07 09:40	pH(6)
Ammonia N	Jan-16-08 12:00	45	Dec-27-07 09:40	pH(1)
Nitrate-Nitrite N	Jan-16-08 12:00	45	Dec-27-07 09:40	pH(1)
BOD	Jan-16-08 12:00	45	Dec-04-07 09:40	pH(6)
NO2 as N	Jan-16-08 12:00	45	Dec-01-07 09:40	pH(1)
TKN	Jan-16-08 12:00	45	Dec-27-07 09:40	pH(1)
Total Phosphorus	Jan-16-08 12:00	45	Dec-27-07 09:40	pH(1)
Solids, TSS	Jan-16-08 12:00	45	Dec-06-07 09:40	pH(6)

0711016-02 011CLB2007S02-Bischer S Rd Side Ditch [Water] Sampled Nov-29-07 12:15 Central

Ammonia N	Jan-16-08 12:00	45	Dec-27-07 12:15	pH(1)
BOD	Jan-16-08 12:00	45	Dec-04-07 12:15	pH(6)
NO2 as N	Jan-16-08 12:00	45	Dec-01-07 12:15	pH(1)
Solids, TDS	Jan-16-08 12:00	45	Dec-06-07 12:15	pH(6)
Solids, TSS	Jan-16-08 12:00	45	Dec-06-07 12:15	pH(6)
Total Phosphorus	Jan-16-08 12:00	45	Dec-27-07 12:15	pH(1)
TKN	Jan-16-08 12:00	45	Dec-27-07 12:15	pH(1)
Nitrate-Nitrite N	Jan-16-08 12:00	45	Dec-27-07 12:15	pH(1)

WORK ORDER

Printed: 1/16/2008 8:04:47AM

0711016

US EPA Region 5 Central Regional Laboratory

Client: Water Division, US EPA Region 5

Project: Michigan CAFO Inspection

Project Manager: Marilyn Jupp

Project Number: 011CLB2007

Analysis	Due	TAT	Expires	Comments
0711016-03 011CLB2007S03-Bischer N Side of RD Ditch [Water] Sampled Nov-29-07 14:30 Central				
Nitrate-Nitrite N	Jan-16-08 12:00	45	Dec-27-07 14:30	pH(1)
Ammonia N	Jan-16-08 12:00	45	Dec-27-07 14:30	pH(1)
Total Phosphorus	Jan-16-08 12:00	45	Dec-27-07 14:30	pH(1)
BOD	Jan-16-08 12:00	45	Dec-04-07 14:30	pH(6)
NO2 as N	Jan-16-08 12:00	45	Dec-01-07 14:30	pH(1)
Solids, TDS	Jan-16-08 12:00	45	Dec-06-07 14:30	pH(6)
TKN	Jan-16-08 12:00	45	Dec-27-07 14:30	pH(1)
Solids, TSS	Jan-16-08 12:00	45	Dec-06-07 14:30	pH(6)
0711016-04 011CLB2007B01-Saginaw Bay District [Water] Sampled Nov-29-07 17:05 Central				
TKN	Jan-16-08 12:00	45	Dec-27-07 17:05	pH(1)
Nitrate-Nitrite N	Jan-16-08 12:00	45	Dec-27-07 17:05	pH(1)
Solids, TSS	Jan-16-08 12:00	45	Dec-06-07 17:05	pH(5)
Solids, TDS	Jan-16-08 12:00	45	Dec-06-07 17:05	pH(5)
Total Phosphorus	Jan-16-08 12:00	45	Dec-27-07 17:05	pH(1)
BOD	Jan-16-08 12:00	45	Dec-04-07 17:05	pH(5)
Ammonia N	Jan-16-08 12:00	45	Dec-27-07 17:05	pH(1)
NO2 as N	Jan-16-08 12:00	45	Dec-01-07 17:05	pH(1)

Work Order No.: 0711016
Project: Michigan CAFO Inspection

Parameter: Total Suspended Solids
Analyst Phone Number: 312-353-7445

ANALYSIS CASE NARRATIVE

General Information

Four water samples, to be analyzed for Total Suspended Solids, were received at the Chicago Regional Laboratory on November 30, 2007. Samples were analyzed on December 4, 2007. All holding times were met.

Sample Analysis and Results

Sample preparation and analysis occurred by using CRL SOP No. AIG018, version No. 03 (Standard Methods 2540D).

Quality Control

All quality control (QC) audits during sample analysis were within CRL limits.

Work Order No.: 0711016
Project: Michigan CAFO Inspection

Parameter: Total Dissolved Solids
Analyst Phone Number: 312-353-7445

ANALYSIS CASE NARRATIVE

General Information

Four water samples, to be analyzed for Total Dissolved Solids, were received at the Chicago Regional Laboratory on November 30, 2007. Samples were analyzed on December 4, 2007. All holding times were met.

Sample Analysis and Results

Sample preparation and analysis occurred by using CRL SOP #AIG017, version no. 04 (Standard Methods 2540D).

Quality Control

All quality control (QC) audits during sample analysis were within CRL limits.

Work Order No.: 0711016
Project: Michigan CAFO Inspection

Parameter: Total Phosphorus
Analyst Phone # 312-353-7445

ANALYSIS CASE NARRATIVE

General Information

Four water samples, to be analyzed for Total Phosphorus, were received at the Chicago Region Laboratory on November 30, 2007. Analysis occurred on December 11, 2007. All holding times were met.

Sample Analysis and Results

Sample preparation and analysis occurred by using CRL SOP No. AIG034, Version 5.2 (Method 365.4). Samples were stored in the refrigerator at all times, except when in use.

Quality Control

All quality control (QC) audits during sample analysis were within CRL limits.

Work Order No.: 0711016

Parameter: Total Kjeldahl Nitrogen

Project: Michigan CAFO Inspection

Analyst Phone # 312-353-7445

ANALYSIS CASE NARRATIVE

General Information

Four water samples, to be analyzed for Total Kjeldahl Nitrogen, were received at the Chicago Region Laboratory on November 30, 2007. Analysis on stated samples occurred on December 19, 2007. All holding times were met.

Sample Analysis and Results

Sample preparation and analysis occurred by using CRL SOP No. AIG035, Version 02 (Method 351.2). Sample was stored in the refrigerator at all times, except when in use.

Quality Control

All quality control (QC) audits during sample analysis were within CRL limits.





MID THUMB IRRIGATION INC.
4801 MUSHROOM RD.
DECKER, MI. 48426

721571

CUSTOMER'S ORC		DATE 11-5-07				
NAME Bischer						
ADDRESS						
CITY, STATE, ZIP						
SOLD BY	CASH	C.O.D.	CHARGE	ON ACCT.	MDSE RETD	PAID OUT
QUANTITY		DESCRIPTION		PRICE	AMOUNT	
1						
2		1,587,000 gallons				
3		manure injected w/tractor		.0065	10,300. ⁰⁰	
4						
5		Balance due 11-30-07				
6						
7		gallons in Dec. .007				
8		" " JAN .0075				
9		" " Feb .008				
10						
11		ETC				
12						
13						
14						
15						
16						
17						
18						
19						
20						
RECEIVED BY Fall work.						

adams
5805

KEEP THIS SLIP FOR REFERENCE

\$10,000 by next Friday -

Manure Application on Tile Drained Fields

Check tile outlets prior to manure applications, during, and after manure applications.

Check tile outlets prior to manure application.														Outlet flow After manure application				
Field ID	Acre	ID of Out-let	Any flow?	Description of flow, rate, color, odor	Date	Manure Source	Manure spreader	Incorporat ion & date	Loads	Acres Cover- ed	Amt. Per acre	Soil conditions	Weather conditions	Any flow?	Description of flow, rate, color, odor			
							Surface or inject	Tillage?										
Deer- Dads	7		NONE	NONE	11-5-07	Dry	Surface		7	7	25-Ton	Dry	SW-15-30	NONE	NONE			
"	7		"	"	11-6-07	"	"		7	7	"	"	W-15-25	"	"			
"	6		"	"	11-7-07	"	"		6	6	"	"	W-5-10	"	"			
Deer- Dads	7		NONE	NONE	11-8-07	Dry	Surface		7	7	25-Ton	Dry	S-15-25	NONE	NONE			
"	7		"	"	11-9-07	"	"		7	7	"	"	E-2-5	"	"			
"	6		"	"	11-12-07	"	"		6	6	"	"	S-5-10	"	"			
"	7		"	"	11-13-07	"	"		7	7	"	"	S-2-5	"	"			
Deer- Dads	7		NONE	NONE	11-14-07	Dry	Surface		7	7	25-Ton	Dry	W-5-15	NONE	NONE			
54 acres - total																		
														54	54 + acres - Total			

April 2004: Other record keeping sheets and information available at www.maeap.org

1350

Manure Applications on Tile Drained Fields

Check tile outlets prior to manure applications, during, and after manure applications.

			Outlet flow Before manure application.												Outlet flow After manure application	
Field ID	Acre	ID of Out-let	Any flow?	Description of flow, rate, color, odor	Date	Manure Source	Manure spreader	Incorporation & date	Loads	Acres Covered	Amt. Per acre	Soil conditions	Weather conditions	Any flow?	Description of flow, rate, color, odor	
							Surface or inject	Tillage?								
Carl-Blocks	12		NONE	NONE	11-19 07		Dry		12		25-Ton	Dry	S-2-5	NONE	NONE	300
"	12		"	"	11-20 07		"		12		"	"	calm	"	"	300
"	14		NONE	NONE	11-28 07		Dry		14		25-T	Dry	SW-5-15	NONE	NONE	350
"	12		"	"	11-29 07		"		12		"	"	W-15-25	"	"	300
"	12		"	"	11-30 07		"		12		"	"	W-15-25	"	"	300
Carl-Blocks	14		NONE	NONE	12-1 07		Dry		14		25-T	Dry	NW-10-20	NONE	NONE	350 76-Loads
40-on Hellem Rd	20		NONE	NONE	12-19 07		Dry		20		25-T	Dry	W-5-10	NONE	NONE	500
"	10		"	"	12-20 07		"		10		"	"	calm	"	"	250
40-on Hellem Rd	10		NONE	NONE	12-21 07		Dry		10		25-T	Dry	calm	NONE	NONE	250 40-Loads

April 2004: Other record keeping sheets and information available at www.maeap.org

2900

Manure Applications on Tile Drained Fields

Check tile outlets prior to manure applications, during, and after manure applications.

			Outlet flow Before manure application.												Outlet flow After manure application	
Field ID	Acre	ID of Out- let	Any flow?	Description of flow, rate, color, odor	Date	Manure Source	Manure spreader	Incorporat ion & date	Loads	Acres Cover- ed	Amt. Per acre	Soil conditions	Weather conditions	Any flow?	Description of flow, rate, color, odor	
							Surface or inject	Tillage?								
Ramsay	23		None	None	1-4 08		Dry		23		23 Ton	DRY	calm good	none	none	
" "	24		None	none	1-5 08		Dry		26		23 Ton	DRY	Sunny	none	none	
" "	29		None	None	1-7 08		Dry		26		23 ton	Dry	good	None	None	
" "	25		none	none	1-10 08		Dry		24		23 ton	Dry	Calm	none	none	
" "	9		none	none	1-17 08		Dry		11		23 ton	Dry	Calm	none	none	
R. Bischof	14		none	none	1-17 08		Dry		14		25 ton	Dry	Calm	none	none	
" "	25		none	none	1-21 08		Dry		25		25 ton	Dry	calm	none	none	
" "	23		none	none	1-25 08		Dry		23		25 ton	Dry	good	none	none	
Paranski	30		none	none	1-26 08		Dry		30		25 ton	Dry	good	none	none	
" "	30		none	none	1-26 08		Dry		30		25 ton	Dry	Calm	none	none	

April 2004: Other record keeping sheets and information available at www.maeap.org

Bio-Solids Analysis for Account 9538

Midwest

Report Number: 07-283-5099

Reported to: NORTHERN THUMB CROP CONSULTING
5434 RICHARDSON
ELKTON
MI, 48731-



Date Reported: Oct 10, 2007

Date Received: Oct 05, 2007

BISCHER FARMS

Lab Number: 10002568

Sample ID: WASTEWATER

Bio-Solids Analysis Report VIEW YOUR SUBMITTAL FORM

Parameters	Analysis	Nutrients	Est. First Year
			Availability
	as Received	lbs/1000gals	lbs/1000gals
Ammonium Nitrogen (N)	0.02 %	1.4	1
Organic Nitrogen (N)	0.04 %	3.0	1
Total Nitrogen (N)	0.06 %	4.4	-
Phosphorus (P ₂ O ₅)	0.01 %	0.8	1
Potassium (K ₂ O)	0.06 %	4.9	4
Sulfur (S)	n.d. %	0.2	0
Calcium (Ca)	0.01 %	1.2	1
Magnesium (Mg)	0.01 %	0.7	0
Sodium (Na)	0.01 %	0.7	0
Copper (Cu)	2 ppm	0.02	0.01
Iron (Fe)	23 ppm	0.19	0.14
Manganese (Mn)	1 ppm	0.01	0.01
Zinc (Zn)	1 ppm	0.01	0.01
Moisture	99.8 %		
Total Solids	0.2 %	16.9	
Total Salts		8.9	
pH	8.4		

n.d. Non Detect

First year availability of nitrogen is calculated based on pre-plant application with incorporation. Nitrogen available from previous year's application not considered.

Total manure salts should not exceed 500 lbs/acre. Less than 500 lbs/acre if annual rainfall is less than 25 inches and/or the soil CEC is less than 12 meq/100g. Salt contributions from commercial fertilizer applications must also be considered.

Soil test yearly to monitor phosphorus levels, organic matter, pH, and micronutrients. Spring soil test for residual nitrate - make accurate sidedress recommendations!

Nitrogen availability will vary with methods of application and field conditions. The nitrogen availability values used on a manure management plan must comply with state regulations. These regulations vary from state to state.

Midwest

Report Number: 06-263-5206

Date Reported: Sep 20, 2006

Reported to: NORTHERN THUMB CROP CONSULTING
 5434
 RICHARDSON
 ELKTON
 MI, 48731-



Date Received: Sep 18, 2006

Sample ID: BISCHER-3

BISCHER FARMS

Lab Number: 9220496

Bio-Solids Analysis Report VIEW YOUR SUBMITTAL FORM

Parameters	Analysis	Nutrients	Est. First Year
			Availability
	as Received	lbs/1000gals	lbs/1000gals
Ammonium Nitrogen (NH ₄)	0.14 %	11.4	11
Organic Nitrogen (N)	0.09 %	7.9	3
Total Nitrogen (N)	0.23 %	19.3	14
Phosphorus (P ₂ O ₅)	0.10 %	8.4	6
Potassium (K ₂ O)	0.15 %	13.1	12
Sulfur (S)	0.03 %	2.2	1
Calcium (Ca)	0.10 %	8.2	6
Magnesium (Mg)	0.03 %	2.8	2
Sodium (Na)	0.02 %	1.6	1
Copper (Cu)	3 ppm	0.02	0.02
Iron (Fe)	25 ppm	0.21	0.15
Manganese (Mn)	8 ppm	0.06	0.04
Zinc (Zn)	12 ppm	0.10	0.07
Moisture	96.6 %		
Total Solids	3.4 %	287.3	
Total Salts		37.1	
pH	7.1		

n.d. Non Detect

First year availability of nitrogen is calculated based on pre-plant application with incorporation. Nitrogen available from previous year's application not considered.
 Total manure salts should not exceed 500 lbs/acre. Less than 500 lbs/acre if annual rainfall is less than 25 inches and/or the soil CEC is less than 12 meq/100g. Salt contributions from commercial fertilizer applications must also be considered.

Soil test yearly to monitor phosphorus levels, organic matter, pH, and micronutrients. Spring soil test for residual nitrate - make accurate sidedress recommendations!

Nitrogen availability will vary with methods of application and field conditions. The nitrogen availability values used on a manure management plan must comply with state regulations. These regulations vary from state to state.

Midwest
 Report Number: 07-282-5053
 Reported to: NORTHERN THUMB CROP CONSULTING
 5434 RICHARDSON
 ELKTON
 MI, 48731-



Date Reported: Oct 09, 2007

Date Received: Oct 05, 2007

BISCHER FARMS

Lab Number: 10002569

Sample ID: 1

Slats

Bio-Solids Analysis Report VIEW YOUR SUBMITTAL FORM

Parameters	Analysis as Received	Nutrients lbs/1000gals	Est. First Year
			Availability lbs/1000gals
Ammonium Nitrogen (N)	0.16 %	13.4	13
Organic Nitrogen (N)	0.11 %	9.4	3
Total Nitrogen (N)	0.27 %	22.8	17
Phosphorus (P ₂ O ₅)	0.11 %	9.1	6
Potassium (K ₂ O)	0.16 %	13.9	12
Sulfur (S)	0.03 %	2.8	1
Calcium (Ca)	0.09 %	7.6	5
Magnesium (Mg)	0.03 %	2.6	2
Sodium (Na)	0.02 %	1.5	1
Copper (Cu)	2 ppm	0.02	0.01
Iron (Fe)	28 ppm	0.24	0.17
Manganese (Mn)	6 ppm	0.05	0.04
Zinc (Zn)	10 ppm	0.08	0.06
Moisture	96.6 %		
Total Solids	3.4 %	287.3	
Total Salts		39.0	
pH	7.8		

n.d. Non Detect

First year availability of nitrogen is calculated based on pre-plant application with incorporation. Nitrogen available from previous year's application not considered.

Total manure salts should not exceed 500 lbs/acre. Less than 500 lbs/acre if annual rainfall is less than 25 inches and/or the soil CEC is less than 12 meq/100g. Salt contributions from commercial fertilizer applications must also be considered.

Soil test yearly to monitor phosphorus levels, organic matter, pH, and micronutrients. Spring soil test for residual nitrate - make accurate sidedress recommendations!

Nitrogen availability will vary with methods of application and field conditions. The nitrogen availability values used on a manure management plan must comply with state regulations. Those regulations vary from state to state.

Midwest
 Report Number: 07-282-5054
 Reported to: NORTHERN THUMB CROP CONSULTING
 5434 RICHARDSON
 ELKTON
 MI, 48731-



Date Reported: Oct 09, 2007

Date Received: Oct 05, 2007

BISCHER FARMS

Lab Number: 10002570

Sample ID: 2

51ats

Bio-Solids Analysis Report VIEW YOUR SUBMITTAL FORM

Parameters	Analysis as Received	Nutrients lbs/1000gals	Est. First Year
			Availability lbs/1000gals
Ammonium Nitrogen (N)	0.16 %	13.8	14
Organic Nitrogen (N)	0.11 %	9.0	3
Total Nitrogen (N)	0.27 %	22.8	17
Phosphorus (P ₂ O ₅)	0.15 %	12.8	9
Potassium (K ₂ O)	0.18 %	15.1	14
Sulfur (S)	0.04 %	3.0	1
Calcium (Ca)	0.12 %	10.4	7
Magnesium (Mg)	0.03 %	2.9	2
Sodium (Na)	0.02 %	1.7	1
Copper (Cu)	2 ppm	0.02	0.01
Iron (Fe)	34 ppm	0.29	0.20
Manganese (Mn)	12 ppm	0.10	0.07
Zinc (Zn)	12 ppm	0.10	0.07
Moisture	96.4 %		
Total Solids	3.6 %	304.2	
Total Salts		43.9	
pH	7.8		

n.d. Non Detect

First year availability of nitrogen is calculated based on pre-plant application with incorporation. Nitrogen available from previous year's application not considered.

Total manure salts should not exceed 500 lbs/acre. Less than 500 lbs/acre if annual rainfall is less than 25 inches and/or the soil CEC is less than 12 meq/100g. Salt contributions from commercial fertilizer applications must also be considered.

Soil test yearly to monitor phosphorus levels, organic matter, pH, and micronutrients. Spring soil test for residual nitrate - make accurate sidedress recommendations!

Nitrogen availability will vary with methods of application and field conditions. The nitrogen availability values used on a manure management plan must comply with state regulations. These regulations vary from state to state.

Midwest
Report
Number: 06-263-5204
Reported
to: NORTHERN
THUMB CROP
CONSULTING
5434
RICHARDSON
ELKTON
MI, 48701



Date Reported: Sep 20, 2006

Date Received: Sep 18, 2006

BISCHER FARMS

Lab Number: 9220494

Sample
ID: BISCHER-1

Bio-Solids Analysis Report VIEW YOUR SUBMITTAL FORM

Parameters	Analysis as Received	Nutrients lbs/1000gals	Est. First Year
			Availability lbs/1000gals
Ammonium Nitrogen (N)	0.18 %	15.4	15
Organic Nitrogen (N)	0.12 %	10.0	3
Total Nitrogen (N)	0.30 %	25.4	19
Phosphorus (P ₂ O ₅)	0.12 %	9.8	7
Potassium (K ₂ O)	0.22 %	18.6	17
Sulfur (S)	0.04 %	3.0	1
Calcium (Ca)	0.12 %	9.8	7
Magnesium (Mg)	0.04 %	3.5	2
Sodium (Na)	0.03 %	2.2	2
Copper (Cu)	3 ppm	0.03	0.02
Iron (Fe)	34 ppm	0.28	0.20
Manganese (Mn)	9 ppm	0.07	0.05
Zinc (Zn)	14 ppm	0.12	0.08
Moisture	95.7 %		
Total Solids	4.3 %	363.3	
Total Salts		49.5	
pH	6.0		

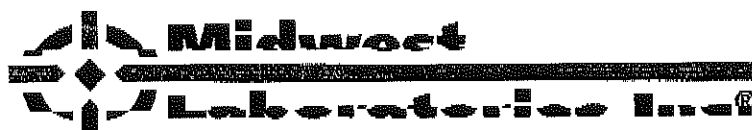
n.d. Non Detect

First year availability of nitrogen is calculated based on pre-plant application with incorporation. Nitrogen available from pre-plant application is not considered.

Total manure salts should not exceed 500 lbs/acre. Less than 500 lbs/acre if annual rainfall is less than 25 inches and/or the soil CEC is less than 12 meq/100g. Salt contributions from commercial fertilizer applications must also be considered.

Soil test yearly to monitor phosphorus levels, organic matter, pH, and micronutrients. Spring soil test for residual nitrate - make accurate sidedress recommendations!

Nitrogen availability will vary with methods of application and field conditions. The nitrogen availability values used on a manure management plan must comply with state regulations. These regulations vary from state to state.

Report Number
05-047-513313611 "B" Street • Omaha, Nebraska 68144-3693 • (402) 334-7770 • FAX (402) 334-9121
www.midwestlabs.com

7.3 ml
cup
12 month
05-047-5133

NORTHERN THUMB CROP CONSULTING
JEFF KROHN
5434 RICHARDSON
ELKTON MI 48731-

Lab Number: 9105317
 Description: BISCHER DAIRY

Sample Id: PEN-~~BACK~~

Report Date: Feb 16, 2005
 Received Date: Feb 14, 2005
 Sampled Date:
 P.O. Number:

Account Number: 9538

Parameters	Analysis as Received	Nutrients lbs/ton	Est. First Year Availability lbs/ton
Ammonium Nitrogen(N)	0.11 %	2.3	1
Organic Nitrogen	0.45 %	9.8	1
Total Nitrogen(N)	0.56 %	11.1	4
Phosphorus(P ₂ O ₅)	0.29 %	5.9	4
Potassium(K ₂ O)	0.61 %	12.3	11
Sulfur(S)	0.08 %	1.5	1
Calcium(Ca)	0.34 %	6.9	5
Magnesium(Mg)	0.10 %	2.1	1
Sodium(Na)	0.06 %	1.2	1
Copper(Cu)	9 ppm	0.02	0.01
Iron(Fe)	274 ppm	0.55	0.38
Manganese(Mn)	31 ppm	0.06	0.04
Zinc(Zn)	32 ppm	0.06	0.05
Moisture	80.9 %		
Total Solids	19.1 %	382.0	
Total Salts		24.8	
pH	9.4		

First year availability of nitrogen is calculated based on preplant application with incorporation within one day. Nitrogen available from previous years application not considered.

Total residue salts should not exceed 1,000 lbs/ton. If residue salinity is less than 20 meq/100g and the soil CEC is less than 12 meq/100g. Salt contributions from commercial fertilizer applications must also be considered. Soil test yearly to monitor phosphorus levels, organic matter, pH, and micronutrients. Spring soil test for residual nitrate - make accurate sidedress recommendations! Nitrogen availability will vary with methods of application and field conditions. The nitrogen availability values used on a manure management plan must comply with state regulation. These regulations vary from state to state.

John Tarnay, Midwest Labs, INC.

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Midwest

Report Number: 07-031-5223

Reported to: NORTHERN THUMB CROP CONSULTING
 5434 RICHARDSON
 ELKTON
 MI, 48731-



Date Reported: Jan 31, 2007

Date Received: Jan 29, 2007

BISCHER FARMS

Lab Number: 9253616

Sample ID: 4

Bio-Solids Analysis Report VIEW YOUR SUBMITTAL FORM

Parameters	Analysis	Nutrients	Est. First Year Availability
	as Received	lbs/1000gals	lbs/1000gals
Ammonium Nitrogen (N)	0.22 %	18.3	18
Organic Nitrogen (N)	0.10 %	8.9	3
Total Nitrogen (N)	0.32 %	27.2	21
Phosphorus (P ₂ O ₅)	0.11 %	9.7	7
Potassium (K ₂ O)	0.26 %	22.4	20
Sulfur (S)	0.03 %	2.9	1
Calcium (Ca)	0.12 %	9.8	7
Magnesium (Mg)	0.04 %	3.4	2
Sodium (Na)	0.03 %	2.6	2
Copper (Cu)	3 ppm	0.03	0.02
Iron (Fe)	37 ppm	0.31	0.22
Manganese (Mn)	8 ppm	0.07	0.05
Zinc (Zn)	12 ppm	0.10	0.07
Moisture	96.2 %		
Total Solids	3.8 %	321.1	
pH	7.2		

n.d. Non Detect

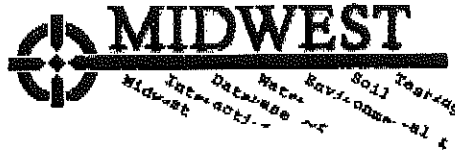
First year availability of nitrogen is calculated based on pre-plant application with incorporation. Nitrogen available from previous year's application not considered.

Total manure salts should not exceed 500 lbs/acre. Less than 500 lbs/acre if annual rainfall is less than 25 inches and/or the soil CEC is less than 12 meq/100g. Salt contributions from commercial fertilizer applications must also be considered.

Soil test yearly to monitor phosphorus levels, organic matter, pH, and micronutrients. Spring soil test for residual nitrate - make accurate sidedress recommendations!

Nitrogen availability will vary with methods of application and field conditions. The nitrogen availability values used on a manure management plan must comply with state regulations. These regulations vary from state to state.

Midwest
 Report
 Number: 07-031-5224
 Reported to: NORTHERN
 THUMB CROP
 CONSULTING
 5434 RICHARDSON
 ELKTON
 MI, 48731-



Date Reported: Jan 31, 2007

Date Received: Jan 29, 2007

BISCHER FARMS

Lab Number: 9253617

Sample
 ID: 5

Bio-Solids Analysis Report VIEW YOUR SUBMITTAL FORM

Parameters	Analysis	Nutrients	Est. First Year
	As Received	lbs/1000gals	Availability
Ammonium Nitrogen (N)	0.20 %	16.6	17
Organic Nitrogen (N)	0.11 %	9.4	3
Total Nitrogen (N)	0.31 %	26.0	20
Phosphorus (P ₂ O ₅)	0.13 %	10.7	7
Potassium (K ₂ O)	0.23 %	19.8	18
Sulfur (S)	0.03 %	2.8	1
Calcium (Ca)	0.12 %	10.5	7
Magnesium (Mg)	0.04 %	3.4	2
Sodium (Na)	0.03 %	2.1	1
Copper (Cu)	3 ppm	0.02	0.02
Iron (Fe)	34 ppm	0.29	0.20
Manganese (Mn)	9 ppm	0.07	0.05
Zinc (Zn)	13 ppm	0.11	0.08
Moisture	95.7 %		
Total Solids	4.3 %	363.3	
Total Salts		52.4	
pH	7.1		

n.d. Non Detect

First year availability of nitrogen is calculated based on pre-plant application with incorporation. Nitrogen available from previous year's application not considered.

Total manure salts should not exceed 500 lbs/acre. Less than 500 lbs/acre if annual rainfall is less than 25 inches and/or the soil CEC is less than 12 meq/100g. Salt contributions from commercial fertilizer applications must also be considered.

Soil test yearly to monitor phosphorus levels, organic matter, pH, and micronutrients. Spring soil test for residual nitrate - make accurate sidedress recommendations!

Nitrogen availability will vary with methods of application and field conditions. The nitrogen availability values used on a manure management plan must comply with state regulations. Those regulations vary from state to state.

Midwest

Report
Number: 06-263-5205Reported
to: NORTHERN
THUMB CROP
CONSULTING
5434
RICHARDSON
ELKTON
MI, 48731-

Date Reported: Sep 20, 2006

Date Received: Sep 18, 2006

BISCHER FARMS

Lab Number: 9220495

Sample
ID: BISCHER-2

Bio-Solids Analysis Report

VIEW YOUR SUBMITTAL FORM

Parameters	Analysis	Nutrients	Est. First Year
	as Received	lbs/1000gals	Availability
Ammonium Nitrogen (N)	0.13 %	11.3	11
Organic Nitrogen (N)	0.08 %	6.4	2
Total Nitrogen (N)	0.21 %	17.7	14
Phosphorus (P ₂ O ₅)	0.09 %	7.4	5
Potassium (K ₂ O)	0.17 %	14.7	13
Sulfur (S)	0.03 %	2.2	1
Calcium (Ca)	0.08 %	6.8	5
Magnesium (Mg)	0.03 %	2.8	2
Sodium (Na)	0.02 %	1.6	1
Copper (Cu)	2 ppm	0.02	0.01
Iron (Fe)	24 ppm	0.21	0.14
Manganese (Mn)	5 ppm	0.04	0.03
Zinc (Zn)	10 ppm	0.09	0.06
Moisture	97.0 %		
Total Solids	3.0 %	253.5	
Total Salts		31.2	
pH	7.4		

n.d. Non Detect

First year availability of nitrogen is calculated based on pre-plant application with incorporation. Nitrogen available from previous year's application not considered.

Total manure salts should not exceed 500 lbs/acre. Less than 500 lbs/acre if annual rainfall is less than 25 inches and/or the soil CEC is less than 12 meq/100g. Salt contributions from commercial fertilizer applications must also be considered.

Soil test yearly to monitor phosphorus levels, organic matter, pH, and micronutrients. Spring soil test for residual nitrate - make accurate sidedress recommendations!

Nitrogen availability will vary with methods of application and field conditions. The nitrogen availability values used on a manure management plan must comply with state regulations. These regulations vary from state to state.

Field	Subfield	Acres	Test Yr	OM%	P	K	Mg	Ca	Units	Soil pH	CEC
Abraham (Stone)	1	31	2004	2.3	76	292			Lb/A	6.3	7.2
Abraham (N&S)	2	101.2	2005	2.2	54	344			Lb/A	7.3	9.2
Abraham (E&W)	3	39.2	2004	1.8	62	379			Lb/A	6.7	8.6
Baranski (big)	4	192	2005	2.7	127	298			Lb/A	7.6	10.1
Baranski woods	5	26.2	2005	2.2	33	284			Lb/A	7.3	10.2
Bischer Art	13	45	2006	3.2	142	279			Lb/A	7.2	7.6
Bischer C. East	14	38.7	2006	2.8	128	259			Lb/A	7.2	8.2
Bischer C. West	15	26.9	2006	2	95	300			Lb/A	6.4	5.8
Bischer, Rick	16	62.2	2006	3.6	154	280			Lb/A	7.3	9.9
Block, Carl	17	76.1	2004	2.4	68	322			Lb/A	7.6	10.8
Candella, J	18	114	2005	3.6	75	276			Lb/A	7	9.7
Connie Wilkowsk	20	55.8	2005	2.1	68	381			Lb/A	7.5	9.6
Cook (40acres)	22	37.6	2006	6.8	94	354			Lb/A	7.7	16.5
Cook N of Ditch	23	41.6	2006	5.3	82	383			Lb/A	7.9	15
Cook Muck	24	85.8	2006	7.9	67	419			Lb/A	7.7	18.1
County/east bak	26	24.8	2004	2	33	128			Lb/A	7.8	9.2
County/east frn	27	53.5	2004	1.6	99	227			Lb/A	7.8	10.7
County farm wes	28	38.2	2006	1.9	58	223			Lb/A	7.9	10.5
Deer, N Fillion	30	81.3	2007	1.9	119	265			Lb/A	6.8	9.2
Deer, S of Home	31	25	2007	2	130	194			Lb/A	6.4	7.6
Deer, N Home	32	9.8	2007	1.9	119	223			Lb/A	6.9	7.7
Deer, Behind H.	33	33.7	2007	1.8	130	202			Lb/A	7.1	7.6
Deer, Fill.&Kar	34	37.8	2007	2.1	237	212			Lb/A	6.9	7.4
Deer, Dads.	35	54.3	2007	2	277	217			Lb/A	6	5.5
Deer, Water twr	29	108.1	2006	2	36	252			Lb/A	8	11.2
Geiger, Duane	38	36.1	2006	1.9	131	412			Lb/A	7.3	7.3

Geiger,Red barn	39	11.2	2006	2.5	52	296	Lb/A	7	10.8
Geiger, Creek	40	33.6	2006	2.1	53	299	Lb/A	7.3	9.4
Geiger, Big	41	101.4	2006	2	87	327	Lb/A	7.4	8.2
Geiger, Ac. Gdm	42	34.6	2006	2.3	169	317	Lb/A	7.2	7
Geiger Home	43	88.7	2006	2	78	405	Lb/A	7.9	10.2
Geiger G- Pa.	44	33.6	2006	2.3	229	373	Lb/A	7.5	8.8
Glinickies	45	140.8	2007	3.4	140	434	Lb/A	7.9	12.8
Glinickies	46	28.5	2007	3.3	112	364	Lb/A	7.9	13
Wood									
Gundlochs NE	47	147.5	2004	1.4	143	290	Lb/A	7.1	7.1
Gundlochs SE	48	137.6	2004	2.1	119	308	Lb/A	7.8	10.6
Gundlochs W	49	270	2007	2.5	75	244	Lb/A	7.9	9.7
Indo S. Kinde	51	79.8	2005	1.9	58	302	Lb/A	7.6	9.2
Indo N. Kinde	52	153.5	2004	1.8	58	242	Lb/A	7.7	10.1
Indo S House	54	116.5	2006	1.8	62	543	Lb/A	7.5	8.8
Kargs	55	154.9	2005	2.3	90	369	Lb/A	7.7	10.6
Kirkpatrick Sou	56	37.5	2006	1.7	72	203	Lb/A	7.6	11
Kirkpatrick Nor	57	44.7	2006	2.1	101	214	Lb/A	7.5	10
Korleski 80	61	73.9	2007	1.8	48	183	Lb/A	7.4	11
Korleski Louis	62	37.3	2007	1.8	48	237	Lb/A	7.4	8.7
D Siemans front	63	47.8	2005	2	180	708	Lb/A	7.4	8.9
D Siemans Back	64	27	2005	2	180	708	Lb/A	7.4	8.9
Leppecks	65	168.5	2005	3	130	422	Lb/A	7.7	11.3
Maikrzek	68	37.8	2005	5	62	457	Lb/A	7.8	14.3
Maikrzek P&P	67	39.6	2005	10.5	160	370	Lb/A	7	25.2
Maikrzek East f	69	40.3	2005	7.6	67	494	Lb/A	7.5	22.6
Maurer long 30	71	28.7	2003	4.8	202	828	Lb/A	7.8	13.6
Mcdonald	74	147.4	2006	1.8	57	233	Lb/A	6.9	8.2
Osentoski	79	143.8	2006	1.9	54	245	Lb/A	7.4	9.2
Parisville Cerne	80	134.9	2006	2.2	79	388	Lb/A	7.8	11.1

Muter	77	8.6	2005	2.5	8	206	Lb/A	7.5	10.6
Muter (big)	78	75.1	2005	2.2	52	242	Lb/A	7.3	10.2
Pionk Big	84	91.9	2007	2.6	33	303	Lb/A	7.3	10.2
Polewatch	86	96.4	2005	2.9	142	420	Lb/A	7	8.9
Pionk small	85	21.7	2007	2.9	29	232	Lb/A	7.6	10.7
Ramseys	87	107.9	2006	2.5	114	417	Lb/A	7.4	9.8
Roberts Krueger	88	74.3	2006	2.3	57	217	Lb/A	7.3	8.6
Shefka East	89	23	2006	3.4	151	432	Lb/A	7.7	11.4
Shefka West	90	17.9	2006	3.4	111	380	Lb/A	7.7	11.8
Sketchers	91	131.5	2005	1.9	62	271	Lb/A	7.3	9.5
Sketcher Windm	92	117.1	2005	1.8	62	543	Lb/A	7.4	8.6
Vigenski east	97	7	2006	1.8	51.5	287	Lb/A	7.4	10.3
Vigenski west	98	67	2006	1.6	32	248	Lb/A	8.2	12.6
Wagner North	99	147.1	2007	2.2	44	284	Lb/A	7.4	10.6
Wagner South	100	141.9	2005	2.3	46	248	Lb/A	7.5	8.8
Weiss, R nw	101	13	2005	1.9	94	390	Lb/A	7.4	9
Weiss R. south	102	55.2	2005	2.2	75	261	Lb/A	7.1	9.1
Weiss, R. north	103	9.5	2005	2.2	170	257	Lb/A	6.8	7.1
Weiss, R. Big	104	62.4	2005	1.6	92	278	Lb/A	6.6	8.4
Ulfig Back	96	31.6	2003	2.3	68	268	Lb/A	7.6	10.5
Ulfig Front	95	78.4	2003	2	84	206	Lb/A	7.5	10
Chuck Walsh	113	95.7	2007	2.3	123	464	Lb/A	7.5	10.7
Russel Lived	114	34.8	2005	6.5	161	553	Lb/A	7.3	18.5
Across Office	116	120.7	2007	2.9	104	468	Lb/A	7.6	11.9
Brad,Pauline s	117	96.6	2003	2.8	234	480	Lb/A	7.2	9.4
By Corn cattle	118	137.6	2005	3.6	203	637	Lb/A	8.1	12.8
Big Field	120	456.1	2006	3.2	154	402	Lb/A	7.6	12.7
Indo's by shed	53	74.9	2005	1.6	54	429	Lb/A	7.2	11
Detroit Edison	36	44.3	2007	2.1	73	179	Lb/A	6.4	8.3
Della Wolschlag	111	150.3	2006	1.9	106.3	367	Lb/A	7.6	9.8

Bud Davis	28	60.3	2005	1.9	115	346	Lb/A	7.5	7.8
W of Sand Hill	112	113.3	2005	3.1	146	385	Lb/A	7.8	10.3
E of Sand Hill	119	25	2005	4.4	246	647	Lb/A	7.6	10.6
Essenmachers	37	78	2005	1.7	78	405	Lb/A	7.5	8.8
Maurers (40)	73	38.1	2005	2.5	234	519	Lb/A	7.9	9
Maurers (60)	72	54.8	2005	3.7	230	697	Lb/A	7.3	11
Behind Cattle	115	299.6	2005	3.2	114	628	Lb/A	7.1	12
McKimm West	75	34.7	2005	2.1	60	171	Lb/A	7.5	8.4
McKimm East	81	31.2	2005	4	102	145	Lb/A	6.1	6
Maikrzek W wood	69	23.1	2005	6.3	133	651	Lb/A	7.3	17.6
Maikrzek E wood	70	11.6	2005	4.8	45	198	Lb/A	7.8	13.6
Peruski	121	114.9	2007	2.6	18	250	Lb/A	7.5	10.9
Thayer Snay rd	122	92	2007	2.1	63	228	Lb/A	7.5	9
Thayer Palms Bu	123	71.8	2007	2.8	91	410	Lb/A	7.6	11.7
Thayer Rus/Goet	124	35	2007	2.4	52	264	Lb/A	7.8	9.6
Thayer Maple F	125	50	2004	2.1	74	361	Lb/A	7.2	9.7
Thayer Acr. 3sm	126	30.3	2007	2.3	79	422	Lb/A	7.7	10.9
Thayer Church	127	210.2	2006	2.2	66	386	Lb/A	7.9	12.2
Thayer Home	128	214.6	2005	2.2	88	254	Lb/A	7.1	11.7
Thay Shock/russ	129	155.8	2007	2.3	97	336	Lb/A	7.1	8.3
Thay Acros/home	130	291.2	2007	2.4	44	290	Lb/A	7.6	9.9
Thayer Russ&Big	131	67.5	2007	2.1	53	231	Lb/A	7.4	8.4
Thayer Maple Ba	132	50	2004	2.3	53	375	Lb/A	7.7	11.1
Thayer Mud rd N	133	75	2004	2.3	50	386	Lb/A	7.4	10.2
Thayer Mud rd S	134	70	2004	2.4	41	368	Lb/A	7.3	10.8
Cement Plant	135	28.8	2007	3.5	66	222	Lb/A	7.4	8.2

